

Canovision 8

SERVICE MANUAL

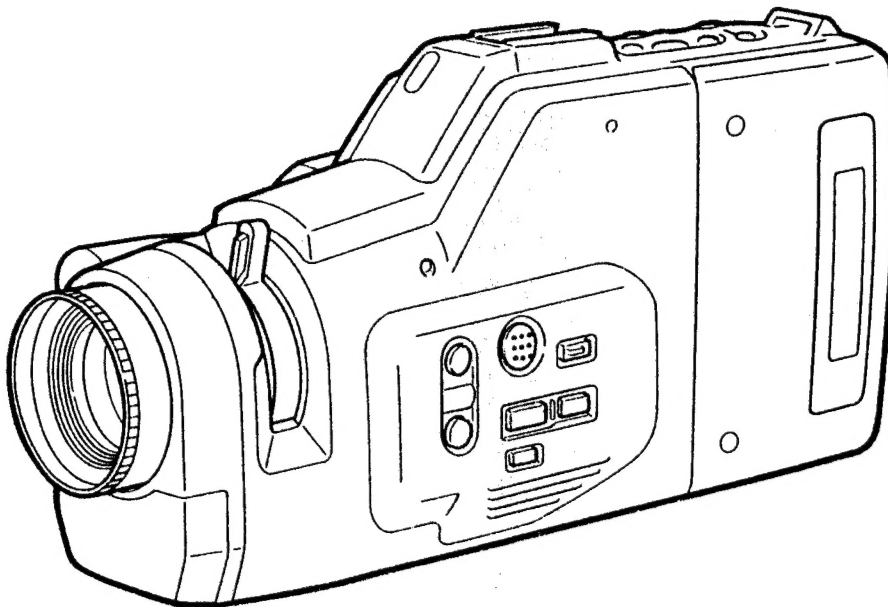
E80E,F

(REF.NO.D15-1430,1470)

8mm Video Camera & Recorder

PAL

SECAM



DY8-1151-430-000
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Canon Inc.
Video Technical Service Dept.
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SAFETY PRECAUTIONS

The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety-related characteristics, always use genuine CANON replacement parts.
Especially critical parts in the power circuit block should not be replaced with other makes.

Critical parts are marked with Δ in the schematic diagrams.

2. The primary source of X-ray radiation in this viewfinder is the picture tube. The tube used in the viewfinder is especially constructed to limit X-ray radiation emission. For continued X-ray radiation protection, the replacement tube must be same type as the original, CANON approved one.
3. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
4. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
5. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

5-1 Leakage Current Cold Check

- 1) Unplug the AC cord and connect a jumper between the two prongs on the plug.
- 2) Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between $1M\Omega$ and $5.2M\Omega$. When the exposed metal does not have a return path to the chassis, the reading must be ∞ .

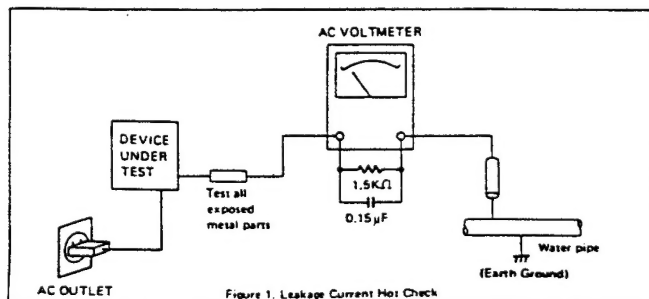
5-2 Leakage Current Hot Check

- 1) Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
- 2) Connect a $1.5K\Omega$ 10 watt resistor, paralleled by $0.15\mu F$ capacitor, between each exposed metallic parts on the unit and a good earth ground such as a water pipe, as shown in figure 1.
- 3) Use an AC voltmeter, with 1000Ω volt or more sensitivity, to measure the potential across the resistor.
- 4) Check all exposed metallic parts of the cover (Cable connection, Handle bracket, metallic cabinet, Screwheads, Metallic overlays, etc), and measure the voltage at each point.
- 5) Reverse the AC plug in the AC outlet and repeat each of the above measurements.
- 6) The potential at any point should not exceed 0.75V RMS.

A leakage current tester (FLUKE MODEL: 8000A equivalent) may be used to make the hot checks.

Leakage current must not exceed 0.5 milliamp.

In case a measurement is out side of the limits specified, there is a possibility of a shock hazard, and corrective action must be taken before returning the instrument to the customer.



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CHAPTER I. GENERAL DESCRIPTION OF PRODUCT

1. Outline

E80 is a compact but powerful video camera recorder which has been developed with top priority given to stable operability in order to allow even a novice to produce his unique documentary in a more free-and-easy way than ever.

1-1 Features

- 1) EVF built-in rotary grip designed according to human engineering
At any shooting posture possible, E80 can be held in a natural manner, relieving your wrist of an excessive burden.
- 2) Full-featured documentary functions
Comprise auto date, title display and various timers which are indispensable for recording a child's growth.
- 3) High-performance 6-power Auto Focus (AF) zoom lens
- 4) Superb picture search function which permits quick cue search on edited pictures
- 5) Space of use further broadened owing to the wireless controller

1-2 Specifications

1-2-1 General

| | |
|-----------------------------------|---|
| Power supply | : 6 V DC |
| Power consumption | : 8.3 W or less (in FF), 7.2 W (in REC) |
| Weight | : Approx. 1.2 kg (main unit only), approx. 1.4 kg (with battery pack and cassette tape) |
| Dimensions | : 118 (W) x 121 (H) x 280 (D) mm |
| Performance guarantee environment | : 0°C to 40°C, RH 85% or less |
| Operation guarantee environment | : -5°C to 45°C, RH 60% or less |
| Signaling principle | : PAL standard color video signal |

1-2-2 Lens Section

| | |
|---------------------------|--|
| Focal length | : 9 mm to 54 mm (zoom ratio: 6-power) |
| Aperture ratio | : 1:1.4 (F1.9 at telephoto end) |
| Lens configuration | : 14 elements in 12 groups |
| Angle of view | : Diagonal : 47°55' to 8°30' Horizontal: 39°10' to 6°50' Vertical : 29°50' to 5°05' |
| Minimum focusing distance | : 1.2 m |
| Zooming | : Power zooming (approx. 8 seconds), manual zooming possible |
| Macro focusing | : Wide-macro function |
| Macro shooting distance | : 4 mm min. (from front end of lens element), AF impossible |
| Filter diameter | : 46 mm (P = 0.75) |
| Iris control | : Auto iris with servocontrol system |
| AF principle | : Infrared beam, active triangulation system |
| AF working range | : 1.2 m to approx. 9 m (with reflectance of 20%) Automatically focused to infinity when subject distance is unmeasurable or infinite. |

| | |
|-------------------------------|--|
| AF working illumination range | : 0 lux to 520,000 lux |
| AF response speed | : Approx. 3 seconds (closest distance to infinity; Infinity to closest distance) |
| AF mode | : 2-step selection between continuous and manual |

1-2-3 Camera Section

| | |
|-------------------------------|--|
| Pickup device | : 1/2-inch CCD solid-state imaging device with 300,000 pixels |
| Spatial modulation frequency | : 4.83 MHz |
| Color separation | : Color difference line sequential system |
| Synchronization | : Internal synchronization |
| Scanning | : 625 lines, 50 fields/25 frames |
| Minimum subject illumination | : 7 lux |
| Subject illumination range | : 7 lux to 100,000 lux |
| White balance | : 2,800°K to 8,000°K |
| Exposure correcting function | : BLC (BackLight compensation with iris opened in about 2 steps) |
| Fading | : Video audio-sync white fading (in approx. 4 seconds), date/time display excluded from fading |
| High-speed electronic shutter | : 1/1,000 sec, 1/500 sec |
| Built-in microphone | : Electret condenser microphone, detachable, non-directional |

1-2-4 EVF Section

| | |
|-------------------------------|---|
| Type of electronic viewfinder | : Incorporated in rotary grip, 0.7-inch monochrome CRT |
| Angle adjustment | : Possible at ±90° vertically. Click provided at top/bottom 4 locations |
| CRT resolution | : Approx. 220 horizontal lines (for camera EE) |
| Finder display | : In characters (alphabetic) |
| Ratio of visual field | : Approx. 90% (versus full scan monitor) |
| Diopter adjustable range | : 0 to -4.0 |
| Eye cup | : Stationary type |

1-2-5 Recorder Section

| | |
|---------------------|--|
| External microphone | : Input impedance : External microphone ... 600 Ω Signal level : External microphone ... -64 dBV (600 Ω) |
| Video output | : Output impedance : 75 Ω Signal level : 1 Vp-p Luminance signal S/N : 43 dB max. Color signal S/N : 40 dB max. Horizontal resolution : Max. 230 TV lines (at center of VTR output) Max. 330 TV lines (at center of camera section line output) |
| Audio output | : Output impedance : 3 kΩ or less Signal level : -10 dBV (line) Frequency characteristic: 40 Hz to 14 kHz (line input) Audio signal S/N : Microphone input 40 dB |

| | |
|-------------------------------------|---|
| Recording method | : Rotary double-head helical scanning, azimuth recording |
| Video signal | : Luminance signal FM modulation Color signal Low frequency conversion |
| Audio signal | : FM system (monaural) |
| Tracking | : Four-frequency pilot tracking (ATF) |
| Tape speed | : 20,051 mm/sec. (SP), 10,026 mm/sec. (LP) |
| Recording time (with use of P5-90): | 1.5 hours (in SP mode) 3 hours (in LP mode) |
| Recording tape | : Conforming to 8 mm video cassette tape specifications Kind of tape : Metallic tape of coated type (MP) Tape thickness : 13 μ m, 10 μ m |
| Recording function | : Camera recording Timer recording : Self-timer recording (SELF) Self-recording started after approx. 10 sec. (SELF 30) Self-recording started after approx. 30 sec. (Recordable 30 sec. approx.) Interval timer recording (INT. 10) Recording for 0.5 sec repeated at 10-sec intervals (INT. 20) Recording for 0.5 sec repeated at 20-sec intervals (INT. 60) Recording for 0.5 sec repeated at 60-sec intervals |
| Playback function | : Normal playback : SP/LP automatically switched over Special playback : Still picture frame playback ... Still frame can be reproduced with double-head drum. Fast forward playback ... Approx. 9 times faster (noise bar fixed) Rewind playback ... Approx. 7 times faster (noise bar fixed) |
| Other optional functions | : Auto date recording : Time and date can be displayed and recorded. Display is erasable. Title recording : Title superimposed by use of built-in titler (character generator) Sepia tone recording : Possible Picture search : Possible. With camera recording interrupted, tape can be played back (in forward/reverse direction) by manipulating the picture search buttons (+, -). Rec. review : Possible. With camera recording interrupted, picture for about 3 sec immediately before is automatically played back when pressing the recording check button. |

1-3 Nomenclature

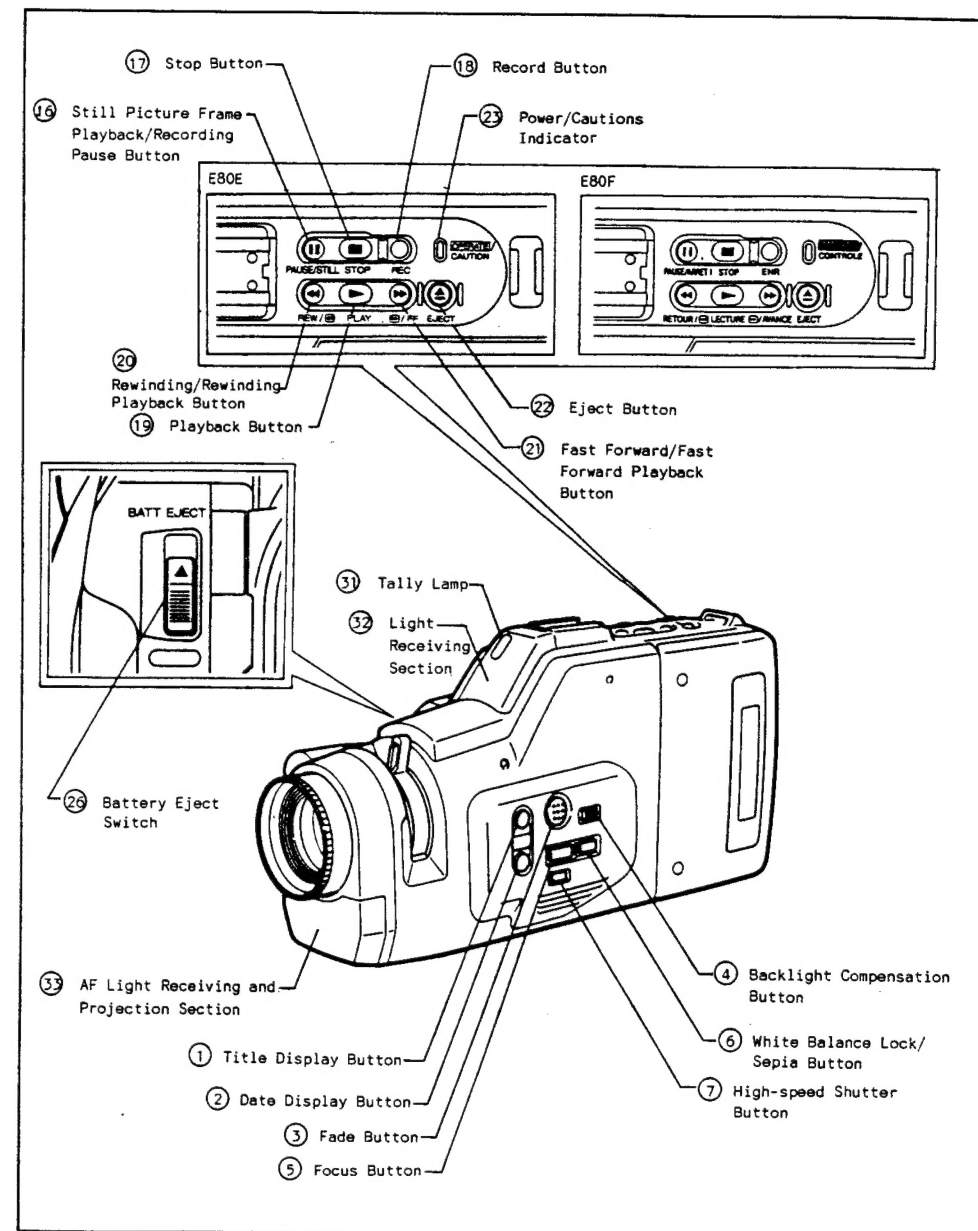


Fig. I-1

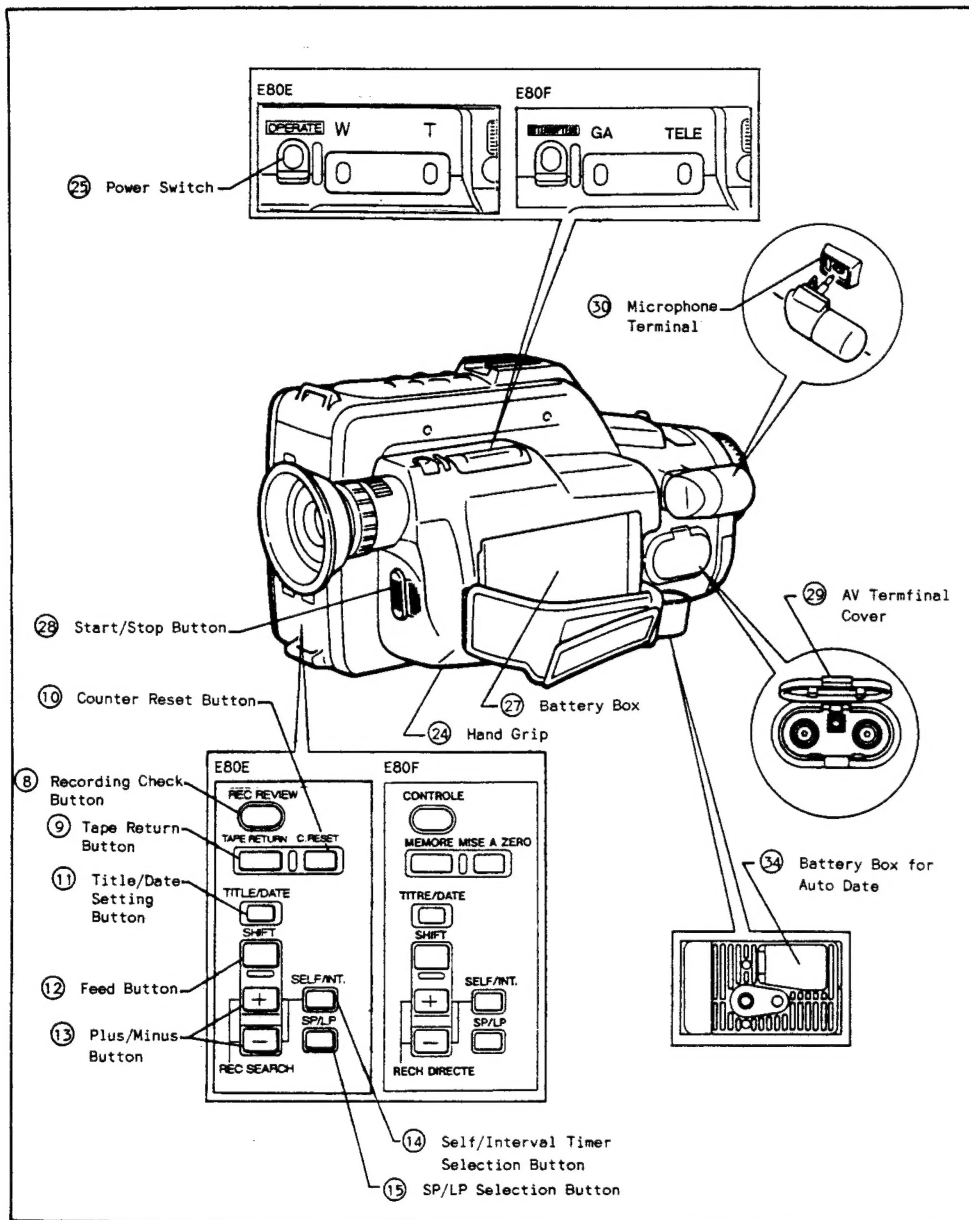


Fig. I-2

1-4 Outline of Operating Section

(Right side face)

- ① Title display button [TITLE]
When pressed in camera mode, a title generated in advance is displayed in the EVF. In camera recording, title superimposition is allowed.
 - ② Date display button [DATE]
When pressed in camera mode, date/time display appears in the EVF. In camera recording, date/time superimposition is allowed.
- | | | | |
|---------------|-------------|---------------|-----------------|
| 23. JAN. 1988 | | 23. JAN. 1988 | |
| No display | ⇒ | No display | ⇒ |
| (at power-on) | (Date only) | 12:34 AM | (Time only) |
| | | No display | ⇒ |
| | | 12:34 AM | (Date and time) |
- ③ Fade button [FADE]
When keeping this button pressed in camera mode, both picture and sound gradually diminish (fade-out). Upon releasing the button, they gradually appear or increase (fade-in). Fading is limited to white and character display in the EVF cannot be faded completely. Not interlocked with the trigger button.
 - ④ Backlight compensation button [BLC]
When keeping this button pressed in camera mode, the iris opens by approximately 2 steps. On releasing the button, normal status is automatically restored. Character display does not appear in the EVF with regard to backlight compensation.
 - ⑤ Focus button [AF/MANUAL]
When pressed in camera mode, auto focusing and manual focusing are selected alternately. In manual focusing mode, "M. FOCUS" appears in the EVF. Immediately after the power turned on, AF mode is set automatically.
 - ⑥ White balance lock/sepia button [AWB LOCK/SEPIA]
When pressed in camera mode, white balance of full-auto white balance can be locked or sepia tone monochrome picture can be selected.

* White balance lock

When pressed in camera mode at auto white balance mode is selected, the current white balance is locked and "WB LOCK" is displayed in the EVF. By pressing the button again, the locked status is released and full auto white balance mode returns.

* Sepia recording

When pressed for 3 seconds or longer in full auto white balance mode, it is switched over to sepia recording mode and "SEPIA" appears in the EVF. Upon pressing the button again, the sepia recording mode is canceled and the full auto white balancing returns.

| | | |
|--|---|------|
| Just push once for locking current white balance. | | |
| FAWB | ⇒ | FAWB |
| Press for about 3 seconds to select sepia recording. | | |

- ⑦ High-speed shutter button [SHUTTER]
When pressed in camera mode, the shutter speed can be switched either 1/1000 or 1/500 sec.

| | | | | | | |
|--------------------------|---|------------|---|-----------|---|-------------|
| Normal mode (1/60 sec) | ⇒ | 1/1000 sec | ⇒ | 1/500 sec | ⇒ | Normal mode |
| (no display at power-on) | | | | | | |

⑧ Recording check button [REC REVIEW]

⑨ Tape return button [TAPE RETURN]

⑩ Counter reset button [C. RESET]

⑪ Title/date setting button [TITLE/DATE]

Normal mode Just push once for setting title generation/editing mode. ⇒ Normal mode

Press for about 3 seconds to set auto date adjustment mode.

⑫ Feed button [SHIFT]

When this button pushed, the cursor (flickering) moves to the next position on the right.



When this button pushed, the adjustable point blinks. It moves in the following sequence: year → month → day → hour → minute. When pressed after "minute", the adjustment mode is released (adjustment is terminated).

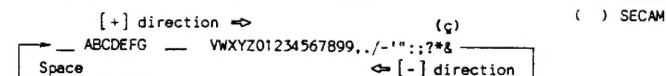
⑬ Plus button/minus button [+]/[-]

When keeping the [+] or [-] button pressed during camera recording is at a pause, pictures recorded on tape are played back forward or backward in the EVF while the tape runs forward or backward. Hence, cue search is possible without changing over to the playback mode.

When the [+] button pressed at timer recording mode, the cursor ([]) advances, and it returns by pressing the [-] button from the timer mode setting.

| | | | | | | | | | | | | |
|---------|---|-----------|---|-----------|---|-----------|---|-----------|---|---------|---|-----|
| [SELF] | | SELF | | SELF | | SELF | | SELF | | [SELF] | | |
| SELF 30 | ⇒ | [SELF 30] | ⇒ | SELF 30 | ⇒ | SELF 30 | ⇒ | SELF 30 | ⇒ | SELF 30 | ⇒ | [+] |
| INT. 10 | | INT. 10 | | [INT. 10] | | INT. 10 | | INT. 10 | | INT. 10 | | |
| INT. 20 | ← | INT. 20 | ← | INT. 20 | ← | [INT. 20] | ← | INT. 20 | ← | INT. 20 | ← | [-] |
| INT. 60 | | INT. 60 | | INT. 60 | | INT. 60 | | [INT. 60] | | INT. 60 | | |

When the **[+]** button pressed in the title generation/editing mode, the character on the cursor changes as shown below. The character display is reversed by pressing the **[-]** button.



When both [+] and [-] pressed simultaneously during title generation or editing, the characters on the cursor and thereafter (right side) are cleared.



⑭ Self/interval timer selection button [SELF/INT.]

When pressed while recording is at a pause, the normal recording mode or the timer recording mode is selectable.

Normal mode \Rightarrow SELF \Rightarrow SELF 30 \Rightarrow INT. 10 \Rightarrow INT. 20 \Rightarrow INT. 60 \Rightarrow Normal mode
(at power-on)

⑮ SP/LP selection button [SP/LP]

SP or LP recording mode is selectable at REC PAUSE FF, REW or STOP mode.

(Main unit top)

⑩ Still picture frame playback/recording pause button [PAUSE/STILL]

When pressed in playback, the still picture frame playback mode is set. When pressed in still picture frame playback, playback mode is selected. When pressed in recording, it is paused, and recording restarts when pressed in the pause mode.

⑰ Stop button [STOP]

When pressed, tape stops running.

⑮ Recording button [REC]

When pressed in stop or at still picture frame playback mode, the recording pause mode is set.

⑪ Playback button [PLAY]

Playback starts when pressed in other than recording mode.

⑳ Rewinding/rewinding playback button [REW/ ⏮]

When pressed in stop status, tape is rewound, and rewinding playback is effected when kept pressed in playback. On releasing the button, playback mode returns. Rewinding playback is also effected only while this button is kept pressed during tape rewinding.

- ②① Fast forward/fast forward playback button [FF]/FF
When pressed in stop status, tape travels in FF mode, and when kept pressed during playback FF playback is set. On releasing the button, the original playback mode returns. FF playback is also effected only while this button is pressed with the tape running in FF.

- ②② Cassette ejection button [EJECT]
When pressed in other than recording mode, the cassette tape is ejected. The button functions even when the power switch is turned off as far as the power source is connected.

- ②③ Power supply/caution lamp [OPERATE]/CAUTION
This lamp lights up during the power supplied. It flickers at 1-sec if the abnormal state such as power failure etc. is occurred.

(Left side face)

- ②④ Hand grip
Can be turned vertically at about 90° (clicks provided at every 22.5° approx.).

- ②⑤ Power switch [OPERATE]
Turns on/off power supply.

- ②⑥ Battery ejection switch [BATT EJECT]
Slide this switch upward for ejecting the power unit from the battery box.

- ②⑦ Battery box
Accommodates the power unit such as battery pack and coupler.

- ②⑧ Start/stop button (trigger button)
Upon pressing this button when recording is at a pause, recording restarts. It pauses again when pressing the button once more. In playback, the button also functions to select mode between normal playback and still picture frame playback. On pressing the button when timer mode is selected, timer recording starts. The recording pauses when pressed during the timer recording.

- ②⑨ AV terminal cover
Houses AV output terminals.

- ③① Microphone terminal [MIC]
When microphone unplugged, an external microphone (low impedance) can be connected.

(Front)

- ③① Tally lamp
Flickers during camera recording or activation of the self-timer. Lit on reception of remote controller's signal.

| | |
|--|------------------------|
| During normal REC/self-timer REC | ON 0.5 sec/OFF 0.5 sec |
| During self-timer standby/interval timer REC | ON 0.5 sec/OFF 1.5 sec |
| On reception of remote control signal | Lit |

- ③② Light receiving section
Window for receiving signal from the remote controller. Light receiving angle is about 30° in the horizontal direction and about 15° in the vertical direction.

- ③③ AF light receiving and projecting section
This section projects infrared beam and receives reflected light. Also serves as a visible light cut filter.

(Bottom)

- ③④ Battery box for auto date
Accommodates a lithium battery for auto date. This battery has a lifetime of about 1 year.

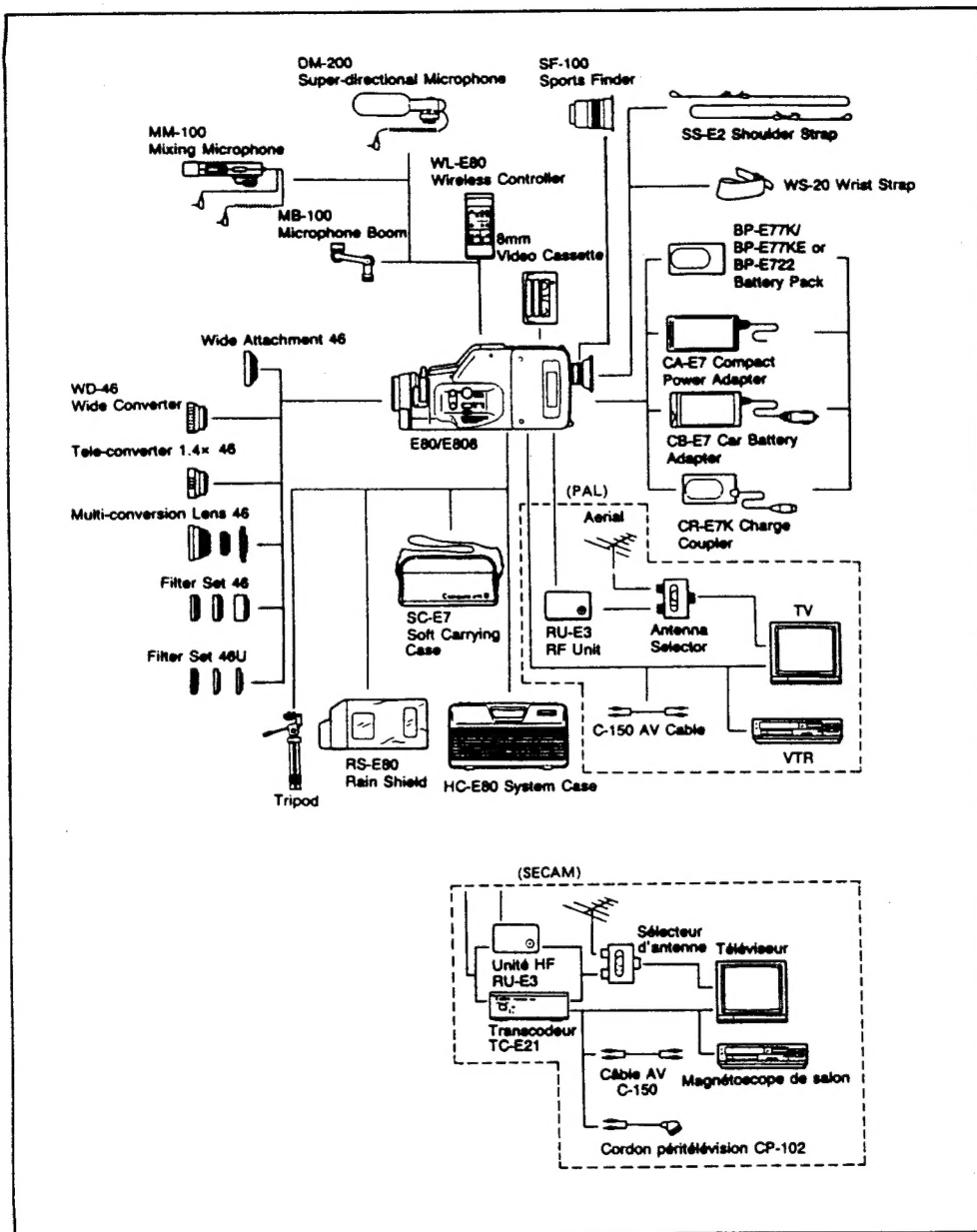


Fig. I-3

2. Circuit Operations

2-1 Lens Section

2-1-1 Optical System

The optical system is identical with the one comprised in the foregoing E70.

2-1-2 AF Mechanism

The AF mechanism also remains the same as the E70's. It employs a combination of the active auto focus by use of near infrared beam and the parallel prism. Note, however, that the AF circuit operates differently.

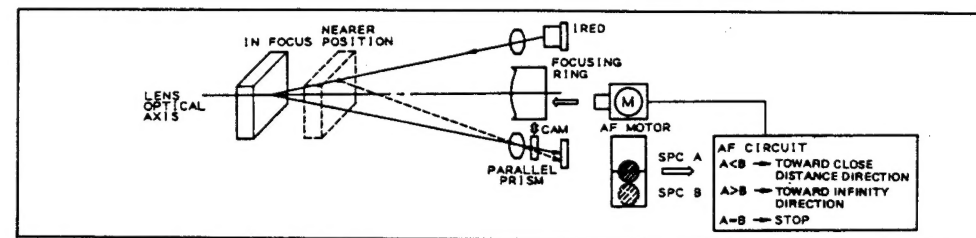


Fig. I-4

2-1-3 AF Circuit

(1) IC configuration

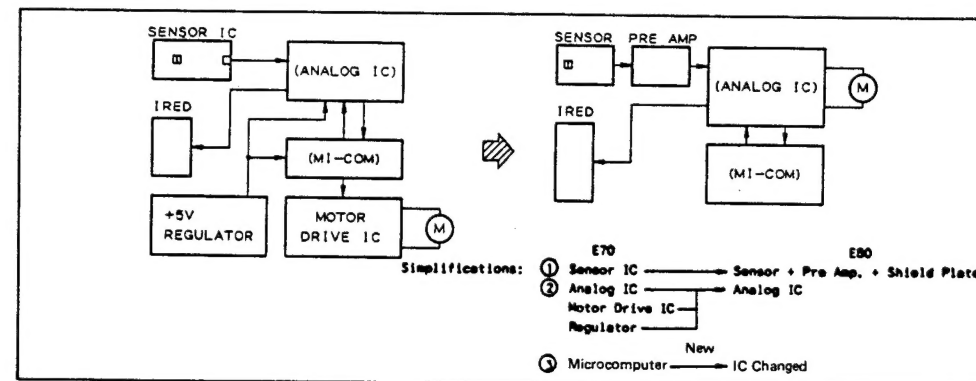


Fig. I-5

Figure I-5 shows each configuration diagram of E70 and E80. Cost reduction has been achieved through simplification of the circuit. The function of each IC is briefed below.

- ① IC4001 (analog IC)
Takes charge of signal processing, IRED drive, motor drive, etc.. Incorporates a +5 V regulator.
- ② IC4002 (microcomputer)
Takes control over IC4001 mode selection, etc..

(2) Operating principle of AF circuit

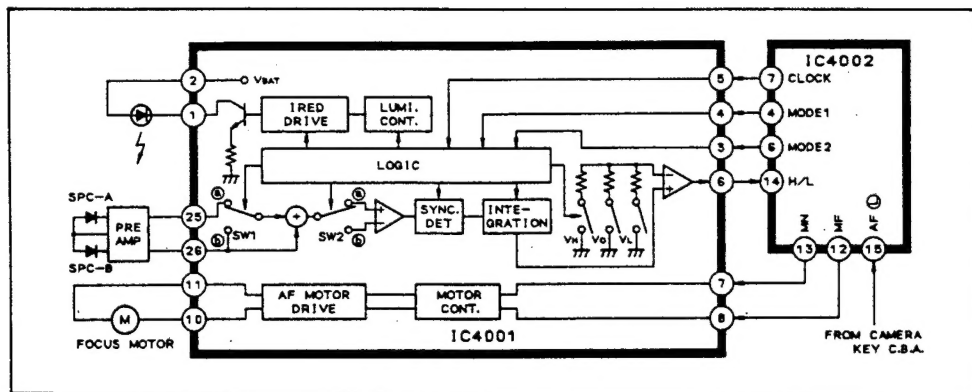


Fig. I-6

① Focus judgement

The near infrared beam emitted from the IRED is reflected by a subject and detected in SPC-A/B. After amplification, the signal is input to the IC4001. In the IC4001, the sum of SPC output (A + B) is subjected to descending integration for the determined time (basically for 40 counts). Then switches 1 and 2 in the IC are turned to (b) side. Ascending integration is done depending on B x 2 signal (SPC-B output x 2) and time is counted until zero crossing is reached. The number of counts is compared between descending integration (count (A)) and ascending integration (count (B)) in order to control the AF motor so as to obtain equal counts.

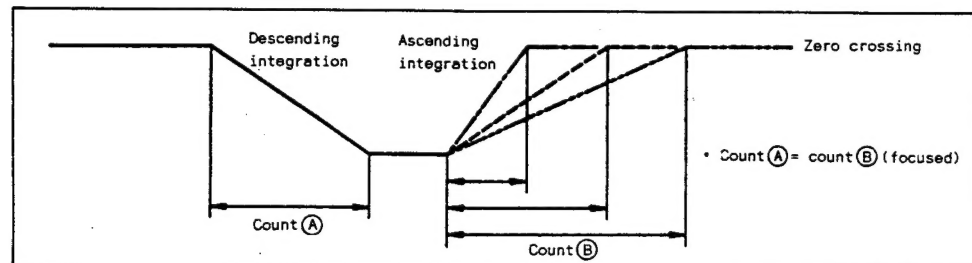


Fig. I-7

② Mode transition (Refer to Fig. I-6)

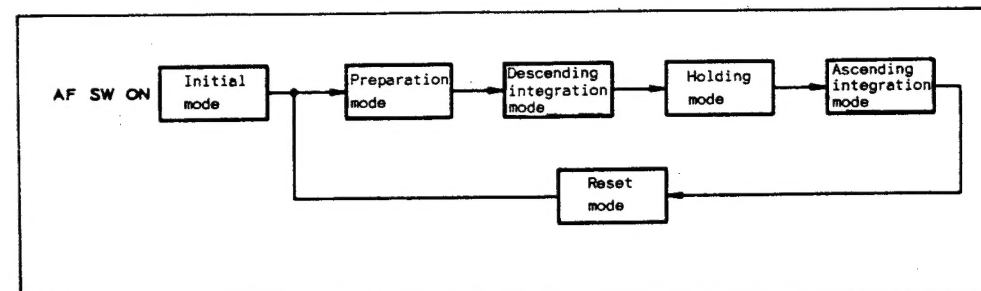


Fig. I-8

1) Initial mode

When the power is turned on and AF (L) signal is fed to pin 15 of IC4002, (H) signal is input to pins 3, 4 and 5 of IC4001. This resets IC4001 to set the initial mode.

2) Ready mode

When (L) signal is output from pins 4, 6 and 7 of IC4002, IC4001 enters into ready mode. In this mode, the light emission level of IRED is decided at first. At the first operation, the maximum light emission level is employed and from the next time on, decision is made with reference to the previous judgement. Light emission level (current level of IRED) is specified to IC4001 from the microcomputer by means of MODE2 pulses.

No. of pulses : 1 to 8 (One additional pulse doubles the current light emission level.)

Light emission level : Min. to max.

After determination of light emission level, IRED emits light 16 times for offsetting and the offset automatic adjustment circuit sets integration output to zero when no signal is available.

3) Descending integration mode

Then MODE1 turns to (H) for the descending integration mode. In this mode, both switches 1 and 2 turn to (a) side and synchronization detecting output signals (A + B) are subjected to descending integration. Upon completion of integration for the determined time period (corresponding to 40, 80 or 160 counts), MODE1 turns to (L) and the holding mode is set.

4) Ascending integration mode

Input of 1 pulse from the MODE1 terminal selects the ascending integration mode. Switches 1 and 2 turn to (b) side, and ascending integration is performed according to B x 2 signal. When the integral value crosses V_0 , comparator output is inverted and the microcomputer stores the descending integration time (counts) in memory. According to that count value, the AF motor is controlled. Because descending integration should be constant, light emission level is controlled so that A + B integration value settles between V_H and V_L . As just the control of light emission level is not sufficient, integration time is switched over among 3 steps, 40, 80 and 160. Judgement is made as ∞ (infinity) in case integral value does not reach V_L level with both light emission level and integration time at maximum.

2-2 Camera Section

2-2-1 Power Supply Circuit

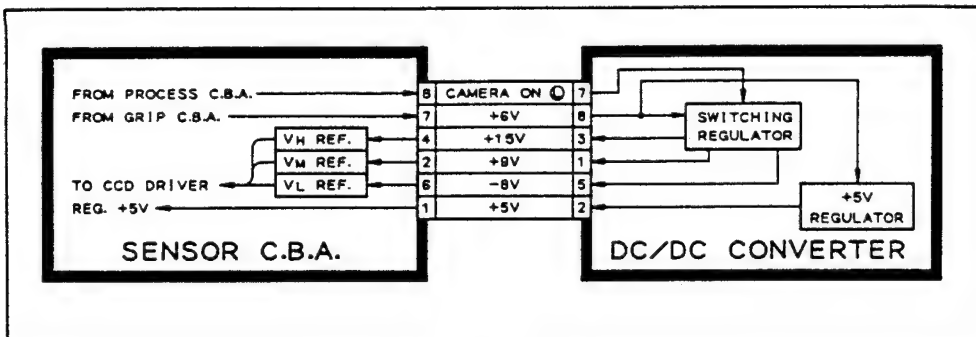


Fig. I-9

The power supply circuit of camera section consists of a DC/DC converter, and V_H , V_M and V_L in the sensor C.B.A.

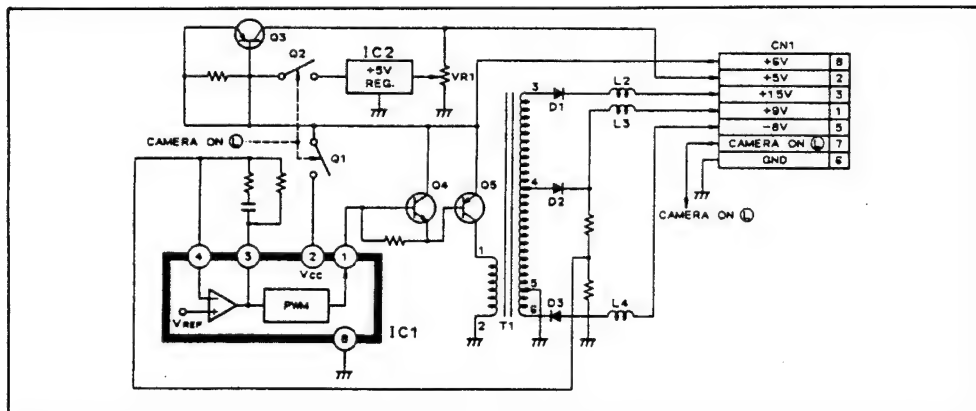


Fig. I-10

(1) DC/DC converter

To operate the DC/DC converter, the power supply (6 V) and IC1 power supply (CAMERA ON $\text{\textcircled{L}}$) are required. The CAMERA ON $\text{\textcircled{L}}$ signal is applied to pin 7 of CN1 and input to the base of Q1 for activation. In consequence, power is supplied to pin 2 of IC1 and PWM signal is output from pin 1 of that IC.

According to the PWM signal, Q4 and Q5 are controlled for switching the 6 V power supply. The pulse, which is output from pin 3 on the secondary side of T1, is rectified and smoothed in D1, L2, etc. and output from pin 3 of CN1. Pulse outputs from pins 4 and 6 of T1 are also rectified and smoothed, and then output as +9 V and -8 V from pins 1 and 5 of CN-1, respectively.

In addition, the DC/DC converter incorporates a +5 V regulator. When CAMERA ON $\text{\textcircled{L}}$ signal is applied to Q2, Q2 and Q3 start operation. These transistors are regulated by IC2 (3-terminal regulator) so as to output +5 V from pin 2 of CN1. The reference voltage of IC2 is adjustable by VR1.

- (2) CCD, V_H , V_M , V_L for V driver and +9 V (in sensor C.B.A.)

+5 V and +15 V from the DC/DC converter are divided with resistors and then subjected to current amplification by Q2051, which are input as V_M (+1 V) and V_H (+13 V) to the CCD V driver IC2051.

For V_L (-8 V), DC/DC converter output is applied to the CCD V driver via the smoothing circuit.

+9 V is utilized as power supply for the CCD H driver circuit and CCD delay line IC2151.

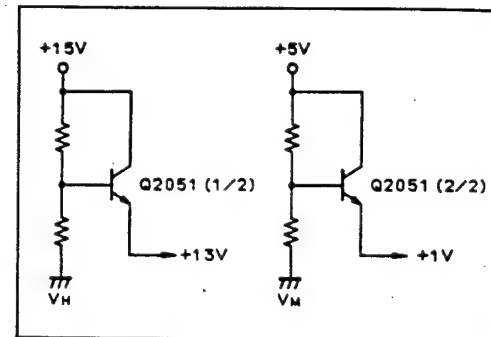


Fig. I-11

2-2-2 Sensor C.B.A.

(1) Configuration

Enumerated below are principal elements of the sensor C.B.A..

- ① IC2101 (CCD)
Similar to the one used in E70 except its model No..
- ② IC2001 (clock generator)
Generates various pulses for CCD drive, etc. Although this IC is identical with the one employed for the E70, 1/500 shutter operating function has been newly added in case of E80.
- ③ IC2002 (SSG)
Generates synchronizing signals necessary for the camera section. Although E70 has this IC on the process C.B.A., it is mounted on the sensor C.B.A. in case of E80.
- ④ IC2051 (CCD V driver)
Amplifies the pulse from IC2001 to generate CCD V drive pulses ($\phi V1$ and $\phi V2$).
- ⑤ Q2052 to Q2057 (CCD H driver)
Amplifies the pulse from IC2001 and thereby generates CCD H drive pulses ($\phi H1$ and $\phi H2$) and reset pulse (ϕR).
- ⑥ IC2102 (sample hold)
Samples/holds the output from CCD and outputs it to the process C.B.A..
- ⑦ IC2151 (1H DL)
1H-delays COH and YOH signals applied from the process C.B.A. to generate C1H and Y1H, which are then returned to that C.B.A.. (Y1H and C1H are utilized for V aperture correction and synchronizing color difference signals, respectively.)

(2) 1/500 sec electronic shutter

E80 has newly employed a 1/500-second electronic shutter in addition to the 1/1000-sec one. In the interline CCD, high-speed electronic shutter operation is performed during the vertical blanking period. (Vertical blanking interval approximates $25H = 1.6$ msec.) Because 1/500-sec shutter operation (about $36H = 1.79$ msec) is longer than the vertical blanking period, part of screen might be cut off. However, an ordinary home monitor TV has an effective image range on screen of 85 to 90% when compared with the full scan monitor. Therefore, screen cut at 1/500 sec shutter operation can hardly be seen. E80's 1/500 sec shutter has been devised based on this subtle distinction.

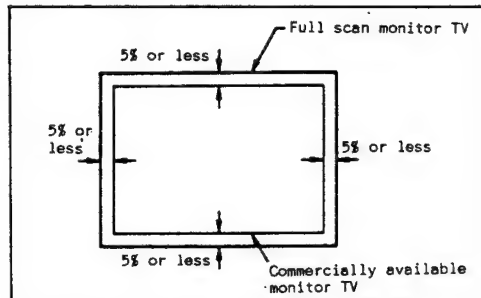


Fig. I-12

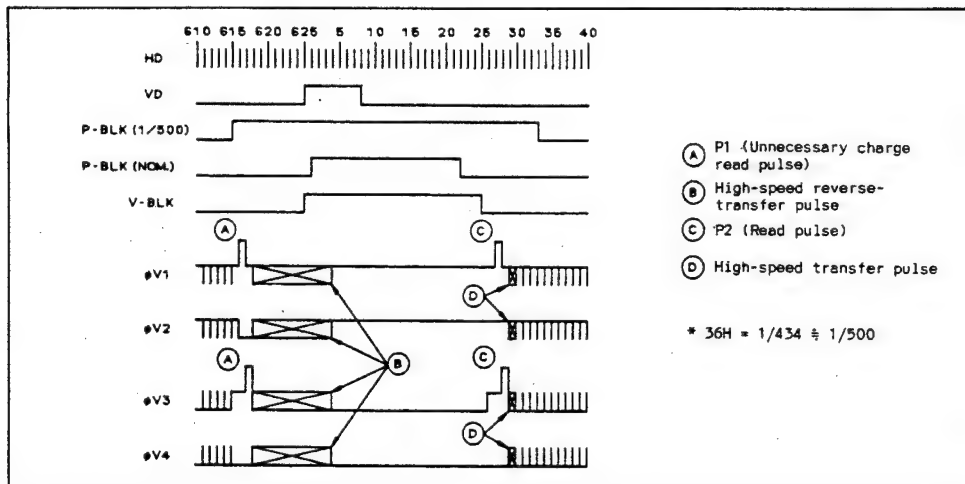


Fig. I-13

1/500 sec shutter operation of E80 is summarized below.

- First unnecessary charge is read by P1 and it is swept out by high-speed reverse transfer pulse. After $28H$, P2 reads necessary charge. ($36H = 1/434$ sec $\approx 1/500$ sec)
- While the first reading (of unnecessary charge) and high-speed reverse transfer are conducted, transfer in V-CCD is not terminated. (About $617H$ to $625H$) Hence, the high-speed reverse transfer pulse mixes as noise in the video signal. This period is deleted by P-BLK pulse.
- At the time of 1/500 sec shutter operation, the P-BLK pulse has a longer duration than usual. And due to its timing, a substantial portion at start of vertical scan might be deleted. To prevent this, video signal is $7H$ advanced by means of high-speed transfer pulse after P2 reading. As a consequence, screen is cut uniformly at the top and bottom to moderate unnaturalness.

2-2-3 Process C.B.A.

(1) Signal flow (luminance signal line)

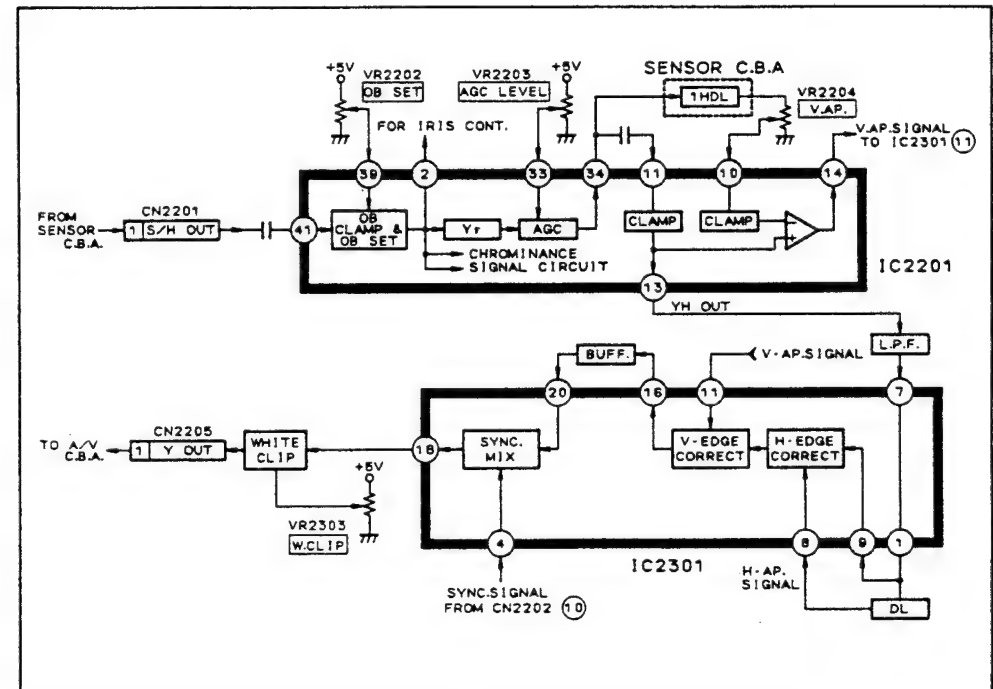


Fig. I-14

S/H OUT signal from the sensor C.B.A. is fed to pin 41 of IC2201. It is divided into 4 routes through OB clamping and OB setting. One is output from pin 2 and used to control the iris. The other two are branched to chrominance signal lines, and the remaining one is applied to the luminance signal line. Luminance signal first undergoes gamma correction and then AGC. It is output from pin 34. One of the outputs is sent to the sensor C.B.A. for generating V aperture signal. After delayed by $1H$, the signal is fed to pin 10 of IC2201. The other output is input to pin 11 and clamped. Then it is output as YH signal from pin 13. The V aperture signal is output from pin 14 and input to pin 11 of IC2301. From the main (YH) signal, unnecessary high frequency component is eliminated through LPF. Then the signal is applied to pin 7 of IC2301. After H/V aperture correction, etc., it is output from pin 16. Input from pin 20 is mixed with sync and burst signal, and is output from pin 18. Then, after being white clipped, it is output as a luminance signal from pin 1 of IC2205 via the buffer amplifier.

[illegible]

S/H signal after processings such OB clamping, etc, is sampled and held by pulses S/H (1) and S/H (2).

From S/H (1) output, S/H (2) is subtracted by SUB AMP (subtraction block) in order to take out G-2B and 2R-G signals at 1H intervals.

At this stage, WB CONT voltage is applied from pins 7 and 8 of IC2201. Because of application before SUB AMP, the white balance voltage have to be synchronized by 1/2 fH pulse.

Now from the SUB AMP output, white-balanced 2R-G (marked R-Y hereafter) and -2B-G (also marked Y-B hereafter) are taken out at 1H intervals, which are output from pin 17 (color difference sequencing output).

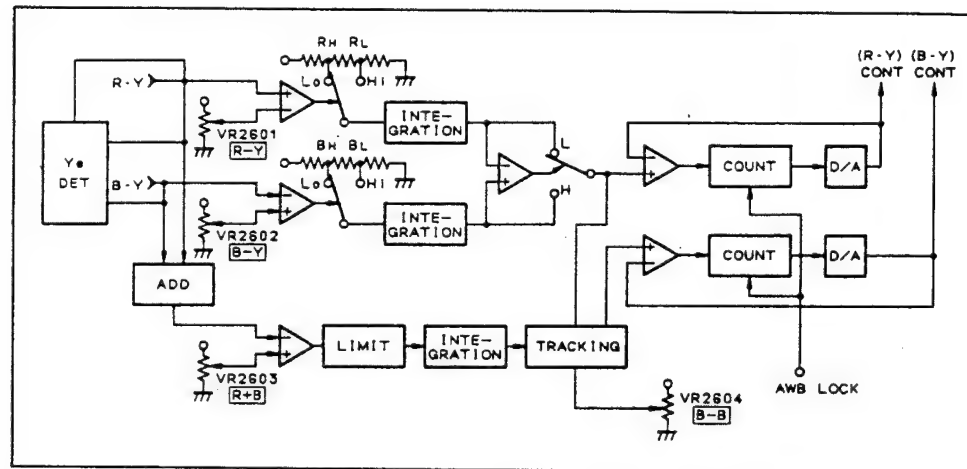
The color difference sequencing output is fed to pin 20 again. The signal is restricted in its band and divided into two after clamping, gamma correction, AGC block, pin 19 and LPF (1 MHz). Of them, one is delayed by 1H in IC2151 (in sensor C.B.A.) and input to pin 30. The other is directly input to pin 29.

At this point, color difference sequencing is synchronized. From the switch onward, a continuous signal of R-Y and Y-B appears. After gain control, inversion (Y-B only) and matrix correction, the signal is output from pins 24 and 27 as R-Y and B-Y signals.

Then the output signal enters IC2301 to be balance-modulated with 3.58 MHz.

This is followed by mixed/low luminance chroma suppression and mixing of fade and burst signals, which is output to pin 31. After clipping high saturation, chrominance signal is output from CN2205 via the buffer amplifier.

For white balance, E80 employs a duplex method of one-axis correction and fluorescent lamp correction as in E70. Also E80's white balance is of an inner measurement system (TTL) depending on video signal. Although the basic principle is shared with E70, a "yellow background skin color correction" circuit has newly been added in order to improve the drawback of one-axis correction that skin color becomes bluish on the yellow background.



(1) Principle of yellow correction

Only when yellow is detected, B-Y signal is mixed with R-Y, whereby color difference in yellow is minimized to diminish the quantity of correction with respect to yellow background. Let us examine the yellow vector on the coordinates of a vector scope. R-Y is positive, while B-Y is negative. Therefore, addition of B-Y to R-Y attenuates R-Y signal. So the R-Y color difference component of yellow becomes smaller.

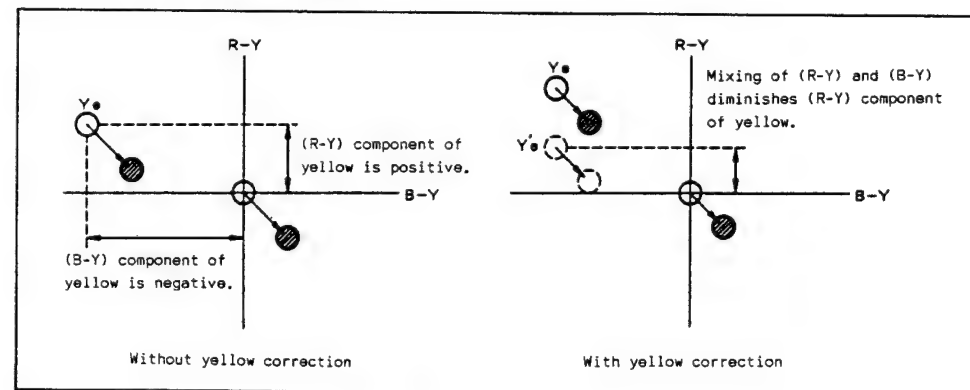


Fig. I-17

(2) Yellow detection circuit

Fig. I-18 shows a block diagram of the yellow detection circuit. On input of yellow signal, each output of comparators (A) and (B) becomes positive. As a result, output of (D) (AND circuit) also becomes positive to turn on Q2601.

Now B-Y signal is mixed with the comparison voltage (R-Y) of comparator (C), which reduces the quantity of yellow correction.

Yellow detection is effective within the range shown in b of Fig. I-19 (C). Quantities of B-Y and R-Y offsets in negative direction are determined according to V_B and V_R .

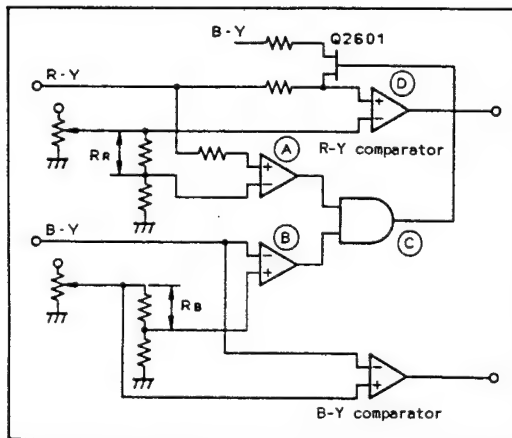


Fig. I-18

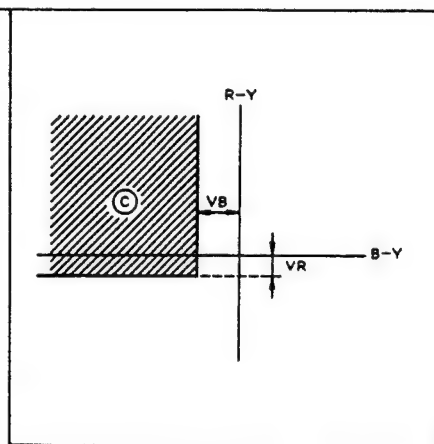


Fig. I-19

2-3 Recorder Section

2-3-1 System Control Circuit

The system control circuit consists primarily of the main microcomputer IC601 and the QD (Quartz Date) microcomputer IC602 on the SS C.B.A.

The main microcomputer IC601 reads each status of keys, sensors, etc. and controls the mechanical unit and signal circuits. It also comprises the function for controlling the servo circuit. For this purpose, control signal is sent to each drive circuit of drum and capstan.

The QD microcomputer IC602, on the other hand, chiefly takes charge of calendar/clock functions and title data storage.

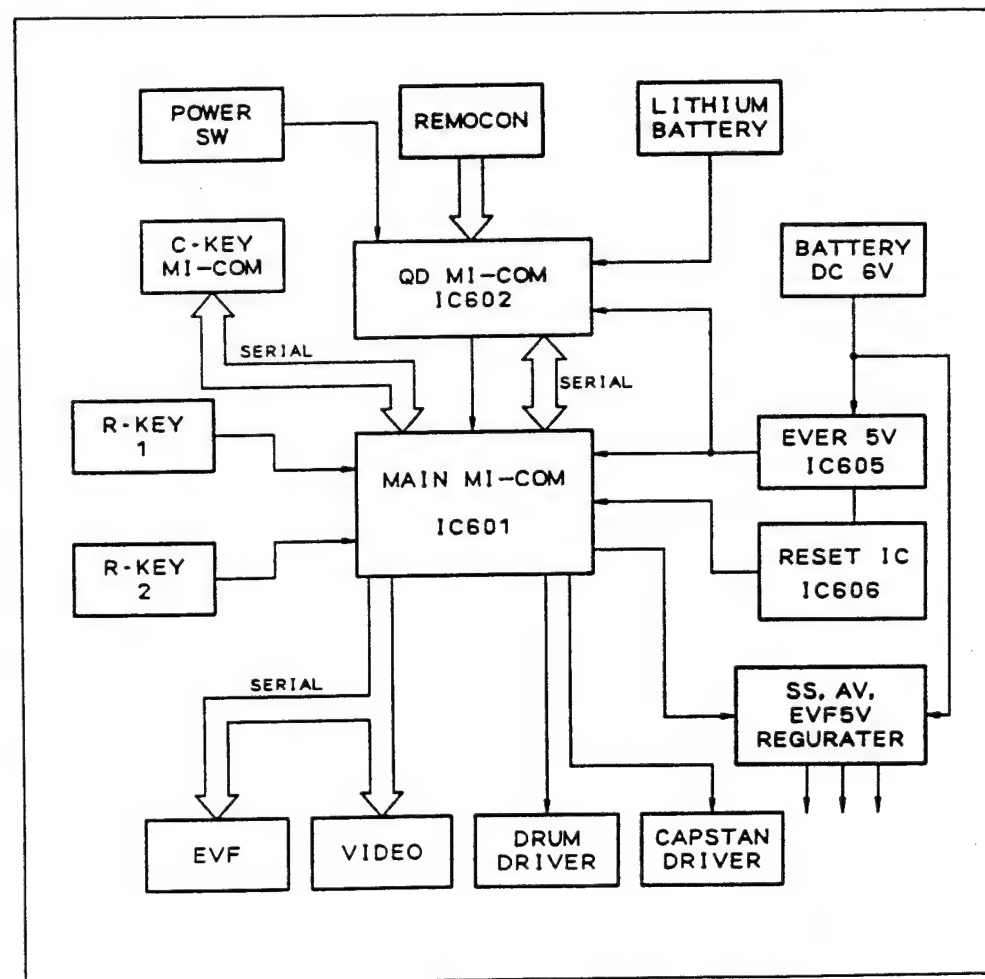


Fig. I-20

(1) Power supply circuit

① Kinds of power sources

The power supply circuit in recorder section receives 6 V DC from the battery or AC adapter and converts it into four levels below to be used in each circuit.
The lithium battery also supplies 3 V DC as back-up power supply.

• EVER 5 V

When power supply is connected to the battery terminal, it is converted into 5 V by the 3-terminal regulator (IC605) on the SS C.B.A.. This output is always available so far as power supply is connected.

• SS 5 V

When turning on the power switch, VTR ON (L) signal is output from pin 29 of the main micro-computer (IC601). This signal turns on Q610 to activate a circuit composed of IC604, Q611 and Q612 whereby constant 5 V output is generated.

• AV 5 V

In the same manner as for SS 5 V, the VTR ON (L) signal from the main microcomputer activates the 5 V generation circuit on the AV C.B.A.. Then, IC107 compares the VR108-defined voltage level with the internal reference voltage level, and the output of transistors Q111 and Q112 are controlled to a constant voltage of 5 V.

• EVF 5 V

Regulator (IC2932) on the grip board is used for controlling the output transistor Q2934 to create a constant voltage of 5 V according to the EVF ON (L) signal output from pin 28 of the main microcomputer.

• LITHIUM 3 V

3 V DC supply from the lithium battery is employed for energizing the QD microcomputer in case the normal power supply is disconnected. When the normal power supply is connected or the power switch is turned on, power is received from "EVER 5 V".

• Power-on

When power supply is connected to the battery terminal, IC605 on the SS C.B.A. delivers EVER 5 V as the power supply to each microcomputer. Then, the RESET signal from reset IC (IC606) is applied to pin 32 of main microcomputer IC601 for resetting. Upon completion of initialization, the microcomputer returns to sleep mode, or it is set in standby status. At this time, the QD microcomputer also stands by in the sleep mode.
When the power switch is turned on, Q620 is activated to apply (L) signal to pin 11 of QD microcomputer. This signal causes the microcomputer to handle interruption for reading the POWER SW ON (L) signal applied to pin 21. And the start pulse is issued from pin 39 to start the main microcomputer. On reception of the start pulse at pin 70, the main microcomputer is reset from the sleep mode and outputs power control signal in response to each mode.
When SS 5 V is generated according to the VTR ON (L) signal appearing at pin 29, Q625 turns on to deliver POWER ON (L) signal to pin 43 of the QD microcomputer as a confirmation of main microcomputer start. Start pulse is issued up to 3 times at intervals of 17 msec. If the POWER ON (L) signal is not detected during issuance of the start pulse, the sleep mode is assumed again.

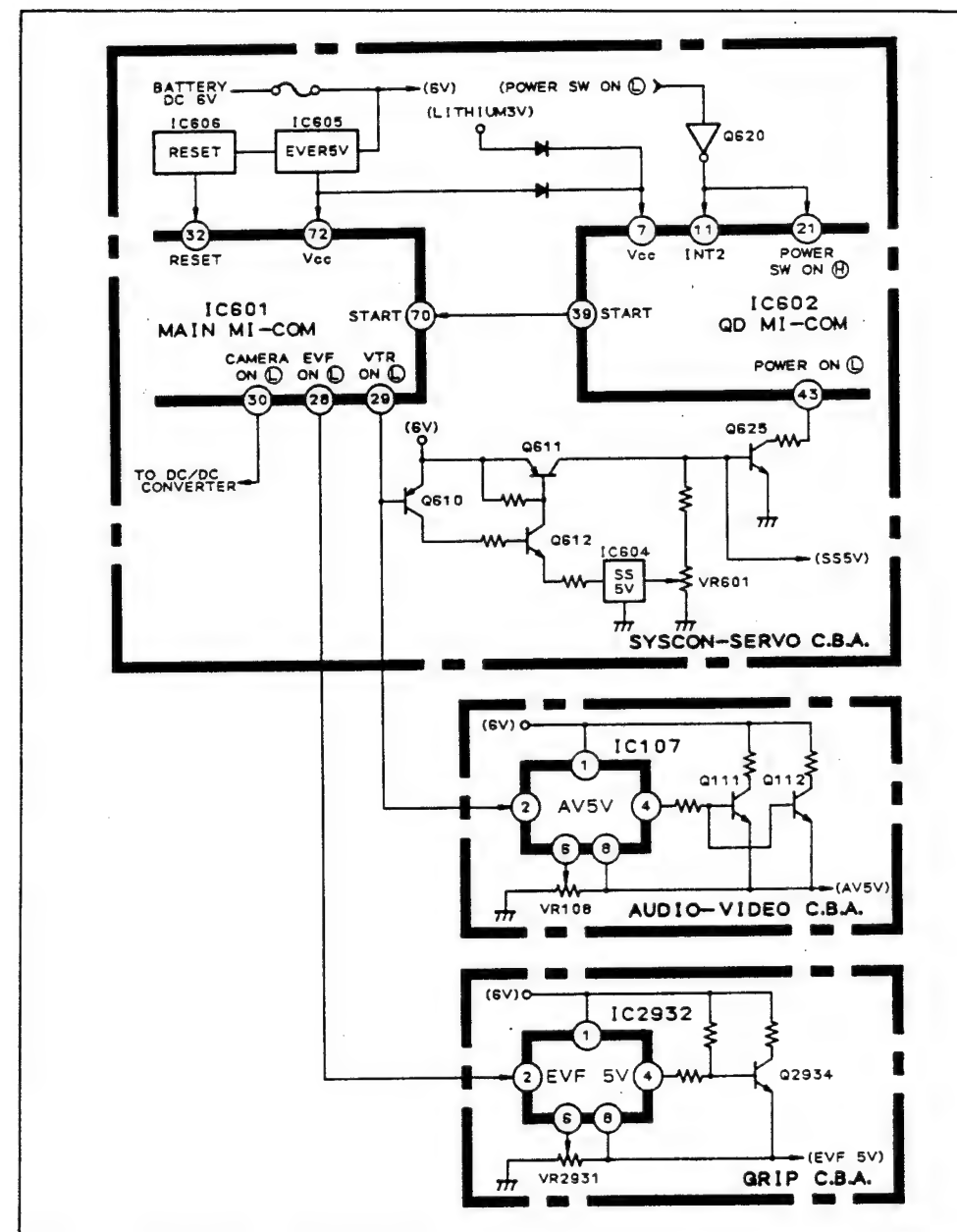


Fig. I-21

(3) Resetting of QD microcomputer

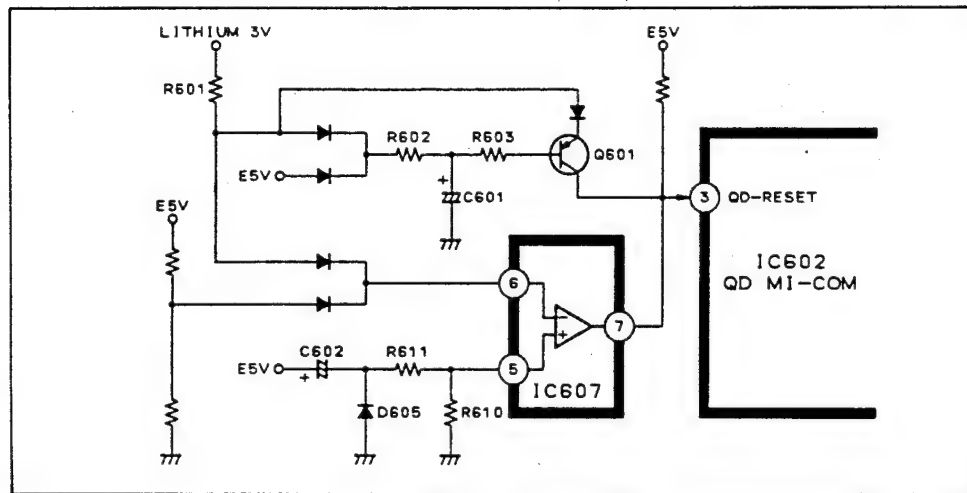


Fig. I-22

This microcomputer is reset in the following cases.

- 1) Lithium battery is introduced when the main battery is not mounted.
- 2) Main battery is introduced when the lithium battery is not mounted.

* Case 1)

When the lithium battery is mounted, 3 V is applied to the Q601 emitter, and the potential at Q601 base rises at the timing determined by each time constant of R602 and C601. Reset pulse is not issued before Q601 turns off. On mounting the main battery, the reset pulse is not generated because the transistor base is already at the (H) level.

* Case 2)

When the main battery is mounted, EVER 5 V is output, and pulse is generated at the timing determined by each time constant of C602 and R611, which is applied to pin 5 of IC607. At this time, the comparator in that IC issues the reset pulse from pin 7 to pin 3 of QD microcomputer for its resetting. On mounting the lithium battery, the reset pulse is not generated since 3 V is applied to pin 6 of IC607.

(2)

Terminal functions of main microcomputer (IC601)

| Terminal | Signal designation | I/O | Function | | | | | | | | | | | | | | | |
|----------|--------------------|----------------|--|----------------|----------------|----------------|----------------|----------------|------|---|---|---|---|------|---|---|---|---|
| 1 | SEL1 | O | Controls the frequencies of ATF PILOT signal. <table><tr><td>PILOT</td><td>f₁</td><td>f₂</td><td>f₃</td><td>f₄</td></tr><tr><td>SEL1</td><td>H</td><td>L</td><td>H</td><td>L</td></tr><tr><td>SEL2</td><td>H</td><td>H</td><td>L</td><td>L</td></tr></table> | PILOT | f ₁ | f ₂ | f ₃ | f ₄ | SEL1 | H | L | H | L | SEL2 | H | H | L | L |
| PILOT | f ₁ | f ₂ | f ₃ | f ₄ | | | | | | | | | | | | | | |
| SEL1 | H | L | H | L | | | | | | | | | | | | | | |
| SEL2 | H | H | L | L | | | | | | | | | | | | | | |
| 2 | HEAD SW. PULSE | O | Head switching pulse output | | | | | | | | | | | | | | | |
| 3 | AV PB (H) | O | Selects REC or PB of the video/audio circuit. "H" for PB. | | | | | | | | | | | | | | | |
| 4 | JOG (H) | O | Switches over time constant of the RF AGC circuit. "H" for accelerated/decelerated playback. | | | | | | | | | | | | | | | |
| 5 | A-MUTE (H) | O | Audio mute signal. "H" for muting. | | | | | | | | | | | | | | | |
| 6 | V-MUTE (H) | O | Video mute signal. "H" for muting. | | | | | | | | | | | | | | | |
| 7 | LINE IN (L) | O | AV terminal I/O selection signal | | | | | | | | | | | | | | | |
| 8 | DRUM FWD (L) | O | Selects turning direction of the head drum motor. "L" for normal (forward) rotation. | | | | | | | | | | | | | | | |
| 9 | DRUM ON (L) | O | Head drum motor on/off signal. When this signal goes low, the head drum motor is turned on, and it is turned off and brake is applied when the signal goes high. | | | | | | | | | | | | | | | |
| 10 | CAPSTAN FWD (H) | O | Selects turning direction of the capstan motor. "H" for normal (forward) rotation. | | | | | | | | | | | | | | | |
| 11 | K-STROBE | O | Serves as the strobe signal for communication with IC2701 (C-KEY microcomputer). Effective during "L" status. | | | | | | | | | | | | | | | |
| 12 | QD-STROBE | O | Responds to communication with IC602 (QD microcomputer). Signal is transmitted/received during "L" period. | | | | | | | | | | | | | | | |
| 13 | V-STROBE | O | Specifies data read in ICs 201 and 203 (video line ICs). | | | | | | | | | | | | | | | |
| 14 | POWER LED | O | "H" to turn on the power LED. Lit when power supply is turned on and flickers at 1-sec intervals for alarm. | | | | | | | | | | | | | | | |
| 15 | NC | | OPEN | | | | | | | | | | | | | | | |
| 16 | NC | | OPEN | | | | | | | | | | | | | | | |
| 17 | C-STROBE | O | Specifies data read in IC2941 (character IC). This signal is output upon completion of data transmission. | | | | | | | | | | | | | | | |
| 18 | ATF SW | O | Selects BFP (16 kHz/47 kHz) for ATF. This signal goes low if an ATF error is detected on the f ₁ or f ₃ track. And, it goes high on detection of an ATF error on the f ₂ or f ₄ track. | | | | | | | | | | | | | | | |
| 19 | BOT (L) | I | "L" on detection of the beginning of tape | | | | | | | | | | | | | | | |
| 20 | EOT (L) | I | "H" on detection of the end of tape | | | | | | | | | | | | | | | |
| 21 | CASSETTE DOWN (L) | I | Indicates the input of CASSETTE COMPARTMENT DOWN switch. This signal goes high when the cassette compartment is in an up state, and it goes low when the cassette compartment is in a down state. | | | | | | | | | | | | | | | |
| 22 | SAFETY TAB (L) | I | This signal goes low when the cassette erroneous-erase protect switch is set to the ERASE-INHIBIT position. | | | | | | | | | | | | | | | |
| 23 | TALLY | O | "H" to turn on the tally LED. This LED flashes at each interval in REC and timer modes, and lights up on reception of remote control signal. | | | | | | | | | | | | | | | |
| 24 | MODE SW3 | I | Indicate the input of mechanism mode switch. (consists of 3-bit for mechanism status detection) | | | | | | | | | | | | | | | |
| 25 | MODE SW2 | | | | | | | | | | | | | | | | | |
| 26 | MODE SW1 | | | | | | | | | | | | | | | | | |
| 27 | TAPE SENS. LED | O | Used to detect BOT/EOT and tape presence/absence. | | | | | | | | | | | | | | | |
| 28 | EVF ON (L) | O | EVF power supply control signal. When this signal goes low, the power supply circuit is turned on. | | | | | | | | | | | | | | | |

Table I-1 (1)

Terminal Functions of Main Microcomputer (IC601) (continued)

| Terminal | Signal designation | I/O | Function | | | | | | | | | | | | | | | |
|-------------------------|--------------------|--------|--|-------------------------|------|--------|-------|------|--------|---|---|---------|---|--------|---|---|---|---|
| 29 | VTR ON (L) | O | VTR power supply (SS, AV 5V) control signal | | | | | | | | | | | | | | | |
| 30 | CAMERA ON (L) | O | Camera power supply control signal. "L" to turn on the power supply. | | | | | | | | | | | | | | | |
| 31 | — | | Connected with ground. | | | | | | | | | | | | | | | |
| 32 | RESET | I | Inputs microcomputer resetting pulse on connection of power supply. | | | | | | | | | | | | | | | |
| 33 | — | | Connected with ground. | | | | | | | | | | | | | | | |
| 34 | X OUT | O | Connect 8 MHz crystal oscillator. | | | | | | | | | | | | | | | |
| 35 | X IN | I | | | | | | | | | | | | | | | | |
| 36 | — | | Connected with EVER 5 V. | | | | | | | | | | | | | | | |
| 37 | QDK-DATA IN | I | Serial inputs of QD, camera key data. | | | | | | | | | | | | | | | |
| 38 | QDK-DATA OUT | O | Serial outputs of QD, camera key data. | | | | | | | | | | | | | | | |
| 39 | CLOCK 2 | O | Clock pulse for QD and K-DATA serial communication | | | | | | | | | | | | | | | |
| 40 | QD-REQUEST | I | Inputs communication request signal from IC602 (QD microcomputer). Communicable during "L" period. | | | | | | | | | | | | | | | |
| 41 | — | | Connected with EVER 5 V. | | | | | | | | | | | | | | | |
| 42 | VC-DATA OUT | O | Outputs video and character data in serial communication. | | | | | | | | | | | | | | | |
| 43 | CLOCK 1 | O | Clock pulse for VC-DATA serial communication. | | | | | | | | | | | | | | | |
| 44 | MAIN BATT. | I | Voltage reduction detecting terminal. | | | | | | | | | | | | | | | |
| 45 | DEW (H) | I | "H" for warning of dew condensation. | | | | | | | | | | | | | | | |
| 46 | T-REEL FG | I | Signal input for detection of T reel turning | | | | | | | | | | | | | | | |
| 47 | S-REEL FG | I | Signal input for detection of S reel turning | | | | | | | | | | | | | | | |
| 48 | R-KEY2 | I | Key input at top of unit | | | | | | | | | | | | | | | |
| 49 | R-KEY1 | I | Key input at rear of unit | | | | | | | | | | | | | | | |
| 50 | SW. POSITION | I | Switching point adjustment terminal | | | | | | | | | | | | | | | |
| 51 | ATF ERROR | I | ATF error input terminal | | | | | | | | | | | | | | | |
| 52 | — | | Connected with ground. | | | | | | | | | | | | | | | |
| 53 | — | | Connected with EVER 5 V. | | | | | | | | | | | | | | | |
| 54 | VCC | | Connected with EVER 5 V. | | | | | | | | | | | | | | | |
| 55 | SEL(A) | I | Switching terminals for TV system <table><tr><td></td><td>DOM</td><td>A</td><td>E</td><td>F</td></tr><tr><td>SEL(A)</td><td>H</td><td>L</td><td>L</td><td>H</td></tr><tr><td>SEL(B)</td><td>H</td><td>H</td><td>L</td><td>L</td></tr></table> | | DOM | A | E | F | SEL(A) | H | L | L | H | SEL(B) | H | H | L | L |
| | DOM | | | A | E | F | | | | | | | | | | | | |
| SEL(A) | H | | | L | L | H | | | | | | | | | | | | |
| SEL(B) | H | H | L | L | | | | | | | | | | | | | | |
| 56 | SEL(B) | | | | | | | | | | | | | | | | | |
| 57 | — | | Connected with ground. | | | | | | | | | | | | | | | |
| 58 | C-SYNC | I | Sync signal input terminal for rotary servo. | | | | | | | | | | | | | | | |
| 59 | ATF LOCK (L) | I | This signal goes low when ATF phase servo is phase-locked normally during playback. | | | | | | | | | | | | | | | |
| 60 | D-PG | I | Drum PG signal input terminal | | | | | | | | | | | | | | | |
| 61 | D-FG | I | Drum FG signal input terminal | | | | | | | | | | | | | | | |
| 62 | C-FG | I | Capstan FG signal input terminal | | | | | | | | | | | | | | | |
| 63 | FADE (L) | O | Fade control signal output. Turned on when "L" outputs. | | | | | | | | | | | | | | | |
| 64 | SP (H) | O | Goes high in SP mode, low in LP mode. | | | | | | | | | | | | | | | |
| 65 | LOADING (H) | O | Loading motor control signals | | | | | | | | | | | | | | | |
| 66 | UN-LOADING (H) | O | <table><tr><td>Signal name / Operation</td><td>LOAD</td><td>UNLOAD</td><td>BRAKE</td></tr><tr><td>LOAD</td><td>H</td><td>L</td><td>H</td></tr><tr><td>UN-LOAD</td><td>L</td><td>H</td><td>H</td></tr></table> | Signal name / Operation | LOAD | UNLOAD | BRAKE | LOAD | H | L | H | UN-LOAD | L | H | H | | | |
| Signal name / Operation | LOAD | UNLOAD | BRAKE | | | | | | | | | | | | | | | |
| LOAD | H | L | H | | | | | | | | | | | | | | | |
| UN-LOAD | L | H | H | | | | | | | | | | | | | | | |
| 67 | C-PWM | O | Generates signal for driving the capstan motor. | | | | | | | | | | | | | | | |
| 68 | D-PWM | O | Generates signal for driving the drum motor. | | | | | | | | | | | | | | | |
| 69 | — | | Connected with ground. | | | | | | | | | | | | | | | |
| 70 | START | I | Releases standby mode input terminal as specified from IC602 (QD microcomputer). | | | | | | | | | | | | | | | |
| 71 | — | | Connected with EVER 5 V. | | | | | | | | | | | | | | | |
| 72 | VCC | | Connected with EVER 5 V. | | | | | | | | | | | | | | | |
| 73 | — | | Connected with ground. | | | | | | | | | | | | | | | |

Table I-1 (2)

Terminal Functions of Main Microcomputer (IC601) (continued)

| Terminal | Signal designation | I/O | Function |
|----------|--------------------|-----|---|
| 74 | — | | Connected with EVER 5 V. |
| 75 | CAPSTAN ON (L) | O | Capstan motor on/off signal. When signal is at "L" level, the motor is turned on, and it is turned off or brake is applied when signal is at "H" level. |
| 76 | FE ON (L) | O | Flying erase head oscillation control signal. "L" to turn on oscillation. |
| 77 | RF PB (H) | O | Signal for selecting REC or PB of head amplifier, ATF IC. "H" for PB. |
| 78 | TS B | O | ATF LOCK sampling and hold signal. "L" for sampling and "H" for holding. |
| 79 | JOG VD | O | Pseudo VD output to be inserted into video signal at the time of decelerated/accelerated playback. |
| 80 | SEL2 | O | Controls the frequency of ATF PILOT signal. Refer to terminal No. 1. |

Table I-1 (3)

(3)

Terminal Functions of QD Microcomputer

| Terminal | Signal designation | I/O | Function |
|----------|--------------------|-----|---|
| 1 | NC | | OPEN |
| 2 | — | | Connected with ground. |
| 3 | QD-RESET | I | Inputs the pulse for resetting the QD microcomputer. |
| 4 | NC | | OPEN |
| 5 | CL1 | I | System clock adjustment terminal |
| 6 | NC | | OPEN |
| 7 | VCC | | Connected with EVER 5 V. |
| 8 | NC | | OPEN |
| 9 | CL2 | I | System clock adjustment terminal |
| 10 | INT1 | I | Interruption terminal when remote control is employed. |
| 11 | INT2 | I | Power switch and eject switch interruption terminal Used to release sleep mode. |
| 12 | CLOCK 2 | I | Clock pulse for QD-DATA serial communication |
| 13 | NC | | OPEN |
| 14 | NC | | OPEN |
| 15 | QD-DATA OUT | O | Issues output to the main microcomputer (IC601) in serial communication. |
| 16 | QD-DATA IN | I | Receives input from the main microcomputer (IC601) in serial communication. |
| 17 | WIDE SW (H) | I | Zoom switch input terminals |
| 18 | TELE SW (H) | I | |
| 19 | MP (H) | I | Goes high with MP tape, and low with ME tape. |
| 20 | NORMAL (L) | I | Selects normal or high band. (Unused) |
| 21 | POWER SW ON (L) | I | Inputs power switch signal. This signal goes low when the switch is pressed. |
| 22 | QD-STROBE | I | Response signal in serial communication with main microcomputer (IC601). Communicable only during "L" period. |
| 23 | EJECT SW ON (H) | I | Inputs eject switch signal. Effective even with power turned off so far as the battery is connected. |
| 24 | REMOCON | I | Inputs code transmitted from the remote controller. |
| 25 | MODE SET SW | I | Inputs signal from the switch which selects title/date setting mode. When pressing the switch once, title mode is selected, and it is changed over to date setting mode when pressing the switch for 3 seconds or longer. |
| 26 | SHIFT SW | I | Cursor and setting item are shifted whenever pressing the SHIFT switch in title/date setting mode. |
| 27 | NC | | OPEN |
| 28 | [+] | I | Used for picture search and title character feeding. |
| 29 | NC | | OPEN |
| 30 | [-] | I | Used for picture search and title character returning. |
| 31 | — | | Connected with ground. |
| 32 | X1 | O | 32 kHz crystal oscillation terminal |
| 33 | VCC | | Connected with EVER 5 V. |
| 34 | X2 | I | 32 kHz crystal oscillation terminal |
| 35 | NC | | OPEN |
| 36 | NC | | OPEN |
| 37 | TEST OUT | O | Outputs the signal obtained by dividing clock frequency into 4 in test mode. |
| 38 | QD-REQUEST | O | Outputs communication request signal to main microcomputer (IC601). Communicable during "L" period. |

Table I-2 (1)

Terminal Functions of QD Microcomputer (continued)

| Terminal | Signal designation | I/O | Function |
|----------|--------------------|-----|---|
| 39 | START | O | Outputs pulse to release microcomputer from standby mode when Power SW or Eject SW is activated. |
| 40 | NC | | OPEN |
| 41 | TEST (L) | I | "L" for test mode |
| 42 | MAIN BATT SET (L) | I | Goes low with main battery mounted. |
| 43 | POWER ON (L) | I | Signal for checking power-up. "L" when power is turned on. |
| 44 | LITHIUM EMPTY (L) | I | Inputs "L" signal when the terminal voltage of lithium battery is about 2.7 V or less. |
| 45 | NC | | OPEN |
| 46 | TELE (H) | O | Zoom motor control signals. Selection is made according to the zoom switch and remote control signal. |
| 47 | WIDE (H) | O | |
| 48 | N/H SELECT | O | Normal/high band selection control signal. "H" for normal band. (Unused) |
| 49 | REMOCON ON (L) | O | AF lock signal. Misoperation is prevented by releasing AF on reception of remote control signal. |
| 50 | — | | Connected with ground. |
| 51 | — | | |
| 52 | — | | |

Table I-2 (2)

(4) Key inputs

The following mechanism key switches are equipped for giving external requests to the microcomputer or letting the microcomputer recognize the current system status. The microcomputer uses these key inputs when identifying status transition.

①

List of Keys at Mechanical Section

| | Name | Shape | Internal/external | Standby cancel function | Switch function |
|-----------|--------------------|-------------|-------------------|-------------------------|--|
| GRIP | POWER | Tact | External | Available | Turns power on/off |
| | TELE/WIDE | Tact | External | Not available | Power zooming |
| | TRIG (START/STOP) | Tact | External | Not available | Starts/pauses recording operation. |
| R-KEY 1 | STOP | Tact | External | Not available | Used for stopping. |
| | PLAY | Tact | External | Not available | Used for playback. |
| | FF | Tact | External | Not available | For fast forward drive/forward search. |
| | REW | Tact | External | Not available | For rewind operation/backward search. |
| | PAUSE/STILL | Tact | External | Not available | Pauses recording or playback. |
| | REC | Tact | External | Not available | Pauses recording. |
| | EJECT | Tact | External | Available | For ejection. |
| R-KEY 2 | COUNTER RESET | Tact | External | Not available | Resets the counter. |
| | TAPE RETURN | Tact | External | Not available | Returns the tape. |
| | TITLE/DATE | Tact | External | Not available | Selects title or date setting mode. |
| | SHIFT | Tact | External | Not available | Shifts the cursor. |
| | PICTURE SEARCH (+) | Tact | External | Not available | Used for picture search and forward/backward character feed. |
| | SEARCH (-) | Tact | External | Not available | |
| | SELF/INTERVAL | Tact | External | Not available | Selects either timer setting mode. |
| | SP/LP | Tact | External | Not available | For SP/LP selection. |
| | REC. REVIEW | Tact | External | Not available | Used for record checking. |
| | SERVICE 1 | Tact | Internal | Not available | Adjusts mechanism drive. |
| | SERVICE 2 | Tact | Internal | Not available | Used for electrical adjustment and operation check. |
| C-KEY | TITLE | Tact | External | Not available | Turns on/off title. |
| | DATE | Tact | External | Not available | Selects calendar, date or OFF. |
| | FADE | Tact | External | Not available | Used for white fading. |
| | AF/MANUAL | Tact | External | Not available | Selects AF function. |
| | HIGH SPEED SHUTTER | Tact | External | Not available | Changes over shutter speed. |
| | AWB/LOCK/SEPIA | Tact | External | Not available | Used for white balance selection and sepia tone setting. |
| MECHANISM | BACKLIGHT COMP. | Tact | External | Not available | Used for exposure compensation. |
| | SAFETY TAB | Leaf | Internal | Not available | Enables/disables recording on cassette tape. |
| | CASSETTE DOWN | Leaf | Internal | Not available | Checks if the cassette holder is down. |
| | MODE | Slide | Internal | Not available | Checks the mechanism status. |
| | CASSETTE IN | Tape sensor | Internal | Not available | Checks if the cassette tape is loaded or not. |

Table I-3

② Key reading

(R-KEY 1, 2)

To reduce the number of microcomputer ports, recorder key uses a single line for reading key information. When switch is pressed, according to the voltage input to the port of microcomputer, the key is judged.

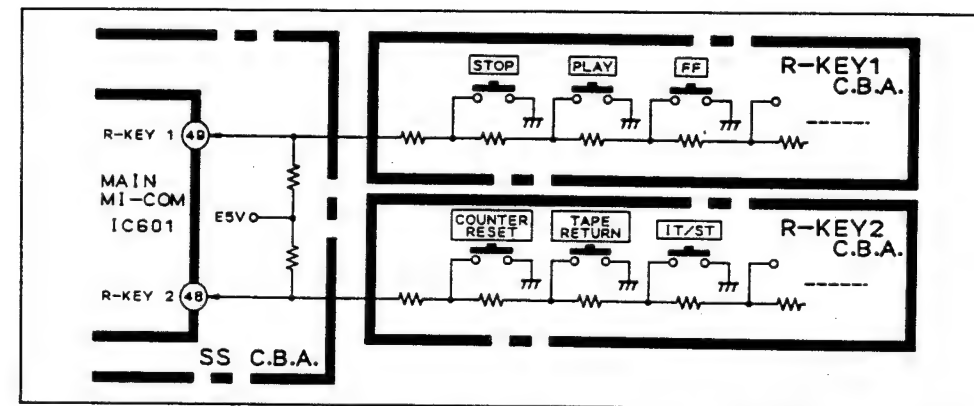


Fig. I-23

Camera Key Matrix

(C-KEY)

The camera key microcomputer (IC2701) employs a 3 x 2 key matrix for 6 kinds of switch readings. Read information is transmitted as serial communication data to the main microcomputer. (Table I-4)

(Mechanism mode switches)

Mode switches are provided for indicating the position of mechanisms. The switch code is changed by the loading motor. The main microcomputer reads the mode switch code to detect the position of mechanisms. (Table I-5)

| | C-KEY OUT 1 IC2701-(14) | C-KEY OUT 2 IC2701-(15) |
|---------------------------|----------------------------|----------------------------|
| C-KEY IN 1 IC2701-(16) | DATE (SW2702) | AWB/SEPIA (SW2705) |
| C-KEY IN 2 IC2701-(17) | AF (SW2703) | FADE (SW2706) |
| C-KEY IN 2 IC2701-(18) | S. SPEED (SW2704) | TITLE (SW2707) |

Table I-4

Switch Codes for Mechanical Section

| | M-SW 1 | M-SW 2 | M-SW 3 |
|--------------|--------|--------|--------|
| EJECT | H | L | L |
| LOAD/UN-LOAD | H | L | H |
| STOP | L | L | H |
| PLAY | L | H | L |

Table I-5

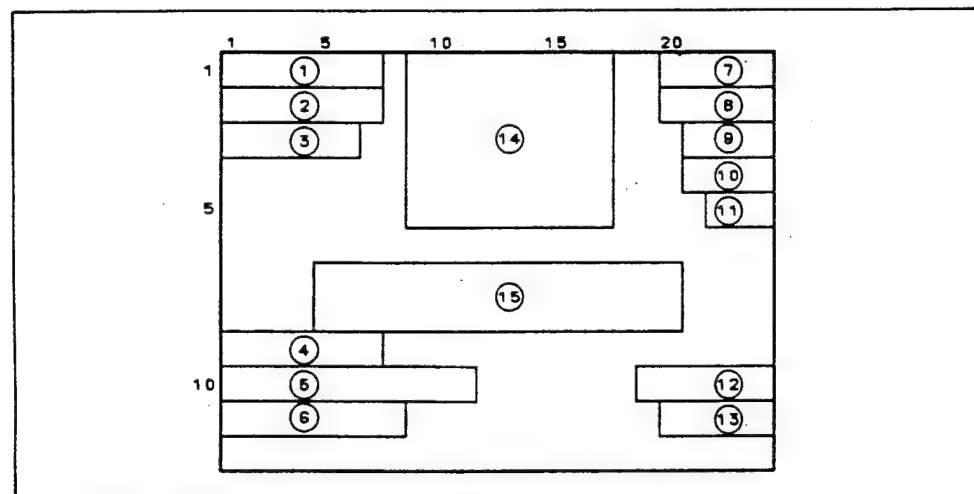
Transition of Mechanical Section

| UN-LOAD ← → LOAD | | | | | | | |
|------------------|----------------|--------------|--------------|---------|------|------------------------|------|
| MODE SW | EJECT | BLANK 1 | LOAD/UN-LOAD | BLANK 2 | STOP | BLANK 3 | PLAY |
| MODE | HOLDER UP/DOWN | LOAD UN-LOAD | | | STOP | REC. PB FF.REW CUE.REW | |

Table I-6

(5) Character display in EVF

This video camera recorder adopts an easy-to-read centralized EVF display system. Besides display of each operation mode and alarm, auto date and title display are available by just one touch.



*[] indicates the SECAM model.

Fig. I-24

- | | | |
|---|--|--|
| ① Focus display M.FOCUS [MANUEL] | ⑦ Tape counter display -0123 | ⑬ Main unit mode display REC [ENR] PLAY [LECT] STOP STILL [ARR.I] PAUSE FF [AVAN.] REW [RET.] EJECT (Flickers) |
| ② White balance/sepia display WB LOCK [BAL MEM] SEPIA | ⑧ Tape presense/end detection display TAPE [BANDE] (Flickers) T.END [BANDE] (Flickers at near end) | ⑭ Timer setting display [SELF] [] SELF 30 INT 10 INT 60 INT 60 |
| ③ Electronic shutter display 1/500 1/1000 | ⑨ Battery insufficiency alarm BATT (Flickers) | ⑮ Title display ABCDEFGHIJKLMN OP QRSTUVWXYZ 012345 |
| ④ Tape speed display SP LP | ⑩ Lithium insufficiency alarm DATE (Flickers) | |
| ⑤ Calendar display 23.JAN.1989 | ⑪ Dew condensation alarm DEW [COND] (Flickers) | |
| ⑥ Clock display 12:34 AM | ⑫ Timer mode display INT 10 INT 20 INT 60 30 SEC (Count) 1 SEC (Count) | |

(6) Data communication

① Between IC601 and IC602

Data of 8 bits x 6 words is communicated bidirectionally between IC601 (main microcomputer) and IC602 (QD microcomputer). Because the main microcomputer lacks memory backup system at power failure, important data must be backed up on the QD microcomputer side. Furthermore, calendar, clock data, etc. are sent from the QD microcomputer to the main microcomputer.

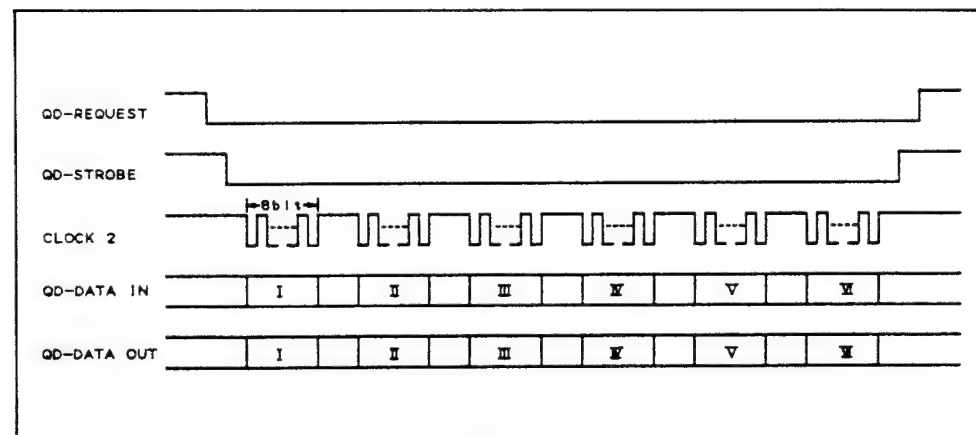


Fig. I-25

- The QD microcomputer requests the main microcomputer to start serial data communication by making the QD-REQUEST signal at pin 38 to low. Then, the serial data communication is started when the main microcomputer makes the QD-STROBE at pin 12 to low within 17 msec.
- Eight CLOCK2 pulses are output from pin 39 of the main microcomputer to complete the exchange of 1 word. In the course of communication, QD-STROBE is always monitored. Just when this signal goes high, the communication is suspended. Normally upon completion of transmitting/receiving 6 words, communication terminates.
- On termination of 6-words communication, QD-STROBE is checked. When the signal becomes high, the QD-REQUEST signal goes high.

* Data configuration

Data Configuration I (QD → Main Microcomputer)

| | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
|-----|---|-----|-------------------|-----|--------------------|-----|------|-------|
| 1st | Day (1 ~ 31) | | | | | 1 | 0 | 1 |
| 2nd | Year (0 ~ 15) | | | | Month (1 ~ 12) | | | |
| 3rd | (-) | (+) | SHIFT CHNG | | Time (0 ~ 11) | | | |
| 4th | AMPM | | Minute(2nd digit) | | Minute (1st digit) | | | |
| 5th | Remote control code (FF unless pressed) | | | | | | | |
| 6th | 1 | 0 | 1 | TAE | LBAT | S/N | EJCT | POWER |

Table I-7 (1)

Data Configuration II (QD → Main Microcomputer)

| | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
|-----|----------------------------------|----|----|----|----------------------|----|----|----|
| 1st | CG block No. (0 ~ 7) | | | | +/- | 0 | 0 | 1 |
| 2nd | Tape counter (1000/10) | | | | Tape counter (100/1) | | | |
| 3rd | CG code #0 (X = 0,1 Y = 0,4,8,C) | | | | | | | |
| 4th | CG codd #1 (X = 0,1 Y = 0,5,9,D) | | | | | | | |
| 5th | CG code #2 (X = 0,1 Y = 0,6,A,E) | | | | | | | |
| 6th | CG code #3 (X = 0,1 Y = 0,7,B,F) | | | | | | | |

Table I-7 (2)

[Main to QD microcomputer]

Data Configuration I (Main Microcomputer → QD)

| | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
|-----|----------------------|----|----|----|--------------------|----|----|------|
| 1st | CG block (Y = 0 ~ F) | | | | +/- | 1 | 0 | 1 |
| 2nd | Tape counter (1000) | | | | Tape counter (100) | | | |
| 3rd | Tape counter (10) | | | | Tape counter (1) | | | |
| 4th | CG code (X = 0) | | | | | | | |
| 5th | CG code (X = 1) | | | | | | | |
| 6th | 1 | 0 | 1 | 0 | Revision item No. | | | TADJ |

Table I-8 (1)

Data Configuration II (Main Microcomputer → QD)

| | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
|-----|----------------------|----|----|----|----|----|----|----|
| 1st | CG block No. (0 ~ 7) | | | | 0 | 0 | 0 | 1 |
| 2nd | * | * | * | * | * | * | * | * |
| 3rd | * | * | * | * | * | * | * | * |
| 4th | * | * | * | * | * | * | * | * |
| 5th | * | * | * | * | * | * | * | * |
| 6th | 1 | 0 | 1 | 0 | * | * | * | * |

Table I-8 (2)

Upon turning on power supply, data II is communicated for reading out back-up data. Then communication is switched over to data I.

② Between IC601 and IC2701

Between IC601 (main microcomputer) and IC2701 (camera key microcomputer), data of 8 bits x 4 words is exchanged bidirectionally. Camera key information is transmitted to the main microcomputer for various processing purposes. On the other hand, the main microcomputer outputs reset signal to reset the camera key microcomputer.

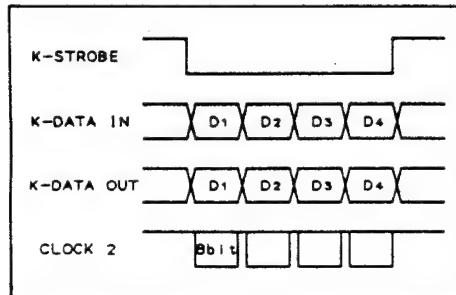


Fig. I-26

Data Configuration I (Camera → Main Microcomputer)

| | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|----------------|--|---|-------|---|---|---|---|---|
| D ₁ | * | * | TITLE | * | 0 | 1 | 0 | 1 |
| D ₂ | W.BL SEPIA 1/500 1/1000 AF REC.R FADE DATE | | | | | | | |
| D ₃ | * | * | * | * | * | * | * | * |
| D ₄ | 1 | 0 | 1 | 0 | * | * | * | * |

Table I-9 (1)

Data Configuration II (Main Microcomputer → Camera)

| | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 1 |
|----------------|---|---|---|---|---|---|-------|-------|
| D ₁ | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| D ₂ | 0 | 0 | 0 | 0 | 0 | 0 | REC.R | RESET |
| D ₃ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| D ₄ | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

Table I-9 (2)

- 1) K-STROBE signal is output from pin 11 of the main microcomputer. Data is transmitted in the "L" period.
- 2) Data D₁ to D₄ are transmitted in synchronization with the CLOCK1 signal appearing at pin 39 of the main microcomputer to terminate communication. At this moment, the K-STROBE signal goes high.

③ Video character data communication

IC601 (main microcomputer) also outputs mode data, character data, etc. to each IC. This microcomputer communicates with 2 ICs: IC105 (video IC) and IC2941 (character IC). All data are communicated over a single line. According to each strobe signal, data is input to each IC. Clock signal is also used in common. At its falling end, output data is set, and it is input at the rising edge.

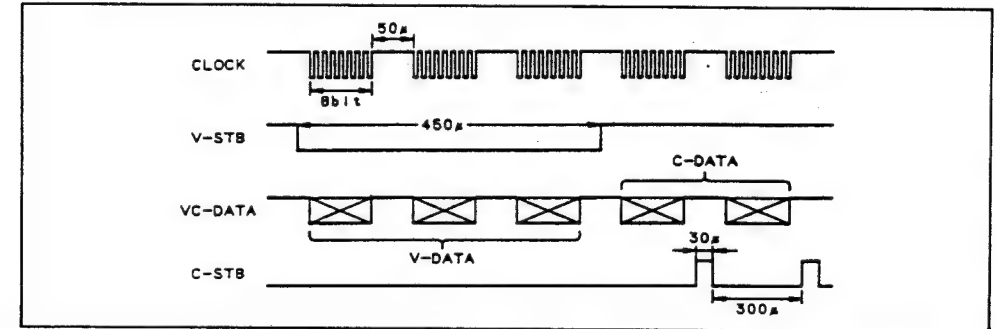


Fig. I-27

* V-DATA transmission

VC-DATA, generated at pin 42 of the main microcomputer. The remaining serial data is sent from pin 22 to pin 19 of video IC105.

V-DATA is transmitted only when any change occurs in the contents of data.

Data Configuration (Main Microcomputer → Video)

| DATA MODE | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|-----------|----|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|
| STOP | H | L | L | H | H | L | H | L | L | H | H | L | H | L | L | L |
| PLAY | SP | H | H | H | H | L | L | H | L | H | L | H | L | H | L | H |
| | LP | H | H | H | H | L | L | L | H | H | H | L | H | L | L | H |
| CUE | H | H | H | H | L | L | L | L | L | H | H | L | H | H | H | H |
| REV | H | H | H | H | L | L | L | L | L | H | H | L | H | H | H | H |
| STILL | H | H | H | H | L | L | L | L | L | H | H | L | H | H | H | H |
| FF | H | L | L | H | H | L | H | L | L | H | H | L | H | L | L | L |
| REW | H | L | L | H | H | L | H | L | L | H | H | L | H | L | L | L |
| REC | H | L | L | H | H | L | H | L | L | H | H | L | H | L | L | L |
| REC.P | H | L | L | H | H | L | H | L | L | H | H | L | H | L | L | L |

Table I-10

* C-DATA transmission

C-DATA is transmitted over the VC-DATA line which connects output from pin 42 of the main microcomputer. Upon completion of transmitting each 8-bit data, only the data, for which C-STROBE signal is transmitted, is read as C-DATA at IC2941-1 pin.

(7) Safety mechanisms

Alarm display, restrictions on acceptance of key entry and operation, etc. are provided for preventing mechanical damage or tape jamming due to abnormal state of the recorder.

① Detection of battery voltage drop

Battery voltage drop is detected in an independent circuit for each of the main and lithium batteries.

* Main battery

The drop of main battery voltage is detected in three stages as follows.

(UNDER CUT1)

When the battery terminal voltage drops to 5.75 V or less, it is detected as a voltage drop. LED at top of the main unit flashes and "BATT" appears in EVF for warning. In this stage, input keys and operations are not regulated, so VCR is operated normally. When voltage in the 6 V line drops below the specified level, the drop detection voltage input to pin 44 of the main microcomputer also goes low. This is judged as UNDER CUT1 status in that microcomputer. Subsequently, the microcomputer flashes LED through feeding signal to pin 14 and brings about alarm display in EVF via the VC-DATA signal output at pin 42.

(UDNER CUT2)

When the battery terminal voltage further drops to 5.55 V or less, it is set to STOP mode automatically and power is turned off. Voltage drop is detected in the main microcomputer as in UNDER CUT1. The microcomputer activates the loading motor, shifts mechanism to the stop position, and then turns off each power supply control signal.

(Shut-off)

When the battery voltage drops to 4.5 V or less suddenly, the reset IC606 is activated to reset the main microcomputer and turn off power supply immediately.

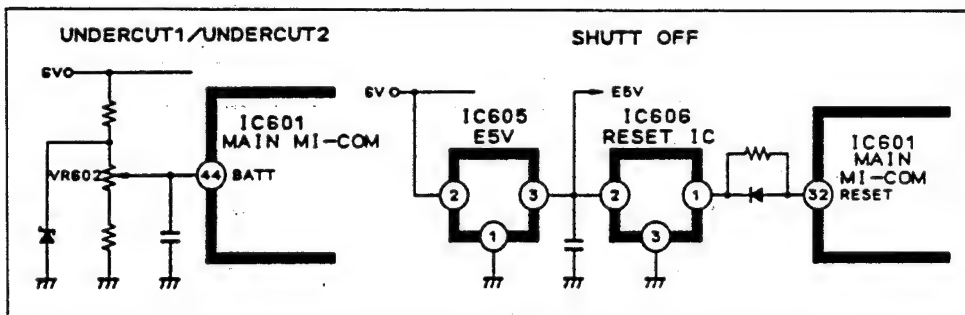


Fig. I-28

* Lithium battery

When the lithium battery thermal voltage falls to 2.7 V or less, the comparator output of IC607 goes low to warn the main microcomputer of voltage drop. The main microcomputer blinks "DATE" display in EVF.

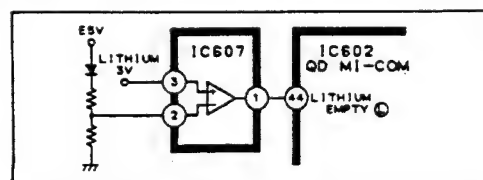


Fig. I-29

② Dew condensation

This VCR incorporates the function for detecting dew condensation in order to prevent tape jamming due to sticking, etc.

If condensation is detected during operation, the mechanism performs DEW EJECT action and transition is made up to the unload/cassette-in status. At this stage, only the POWER and EJECT switches are effective. Even after removal of dew condensation, other key inputs are not acceptable only after power is turned off or the cassette is ejected. Loading is not implemented even when inserting a cassette while condensation remains.

As an alarm, the LED at the top of main unit, and "DEW" and "EJECT" display in EVF both flicker.

Under condensation, the DEW sensor on the recorder mechanism chassis increases its resistance and pin 45 of the main microcomputer receives an increased DEW detection voltage. Upon rise beyond a certain specified level, the microcomputer judges that condensation has occurred, and triggers mode transition and alarm display as above.

[DEW EJECT]

Once tape has adhered to the head drum, the takeup reel alone is inadequate for rewinding the tape. So the supply reel must also be used for rewinding. For this purpose, the DEW EJECT sequence is effected as illustrated below in the event of dew condensation.

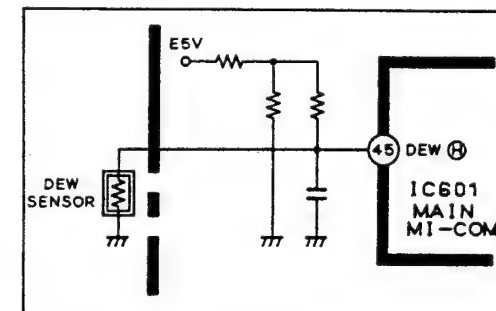


Fig. I-30

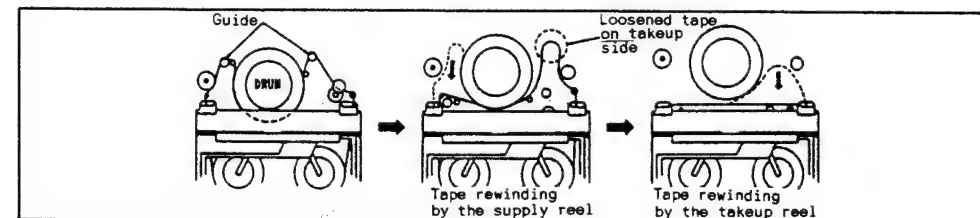


Fig. I-31

③ End-of-tape check

If the tape is run even after reaching its end, it may cause damage on the tape guide or squeezing on the head drum. To prevent this, the end-of-tape check function is provided in the system. When the end of tape is detected, the tape drive is forced to stop immediately.

The tape end detection LED is turned on/off according to the signal from pin 27 of the main microcomputer IC601. It always flickers at intervals of 1 msec. When the END SENS signals at pins 19 and 20 go low twice successively, the microcomputer judges that the end of tape is reached and it causes the mechanisms to stop.

Also, when the EOT and BOT input signals become low twice successively at the same time, the microcomputer judges that the cassette is not loaded and it makes "TAPE" display blink in the EVF.

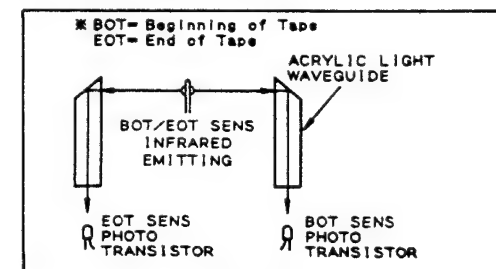


Fig. I-32

④ Pause timer

In the REC PAUSE or STILL mode, the head drum rotates with the tape traveling around it. If this condition persists for a certain period of time, it may cause tape abrasion or head clogging. To prevent this, the STOP position is taken to turn power off after a lapse of seven minutes in the REC PAUSE mode. In the STILL mode, just the STOP position is taken.

⑤ Trouble stop (error)

When the main microcomputer (IC601) detects an error, the unload mode is set. Thereafter, only the POWER and EJECT switches become effective. For alarm display, the LED at the top of the main unit and "EJECT" display in the EVF both flicker.

Content/Detection of Trouble Stops

| Kinds of trouble stop | Contents | Method of detection |
|----------------------------|---|---|
| Drum error | Deviation from specified speed by $\pm 1\%$ or more (continuously for 2 sec or longer) | D-FG signal input to pin 61 of IC601 |
| Capstan error | Deviation from specified speed by $\pm 20\%$ or more (continuously for 2 sec or longer) | C-FG signal input to pin 62 of IC601 |
| Reel error | Reel does not turn. (8 sec or longer at playback 8/each fast-speed sec for other modes) | Reel FG input to pins 46 and 47 of IC601 (T reel for forward feed and S reel for backward feed) |
| Loading motor/safety timer | Mode transition is not completed within determined time period (pinch roller pressing 2 sec and other 8 sec). | Timer in IC601 and mode switch input to pins 24 to 26 |

Table I-11

The service mode signifies a function for reporting the cause of trouble stop if an error occurs. This function is activated by using the service switch on the R-KEY 2 circuit board or shorting the remote control service pattern. For details, refer to "(8) Other functions ⑥" explained below.

(8) Other functions

① Tape counter

The main microcomputer (IC601) counts reel FG and transmits it to the character IC (IC2941) via data communication for counter display in the EVF. In actual operation, supply and takeup reel FG signals input to microcomputer pins 46 and 47 are counted and then mixed. Whenever counted 5 times internally, the tape counter advances by 1.

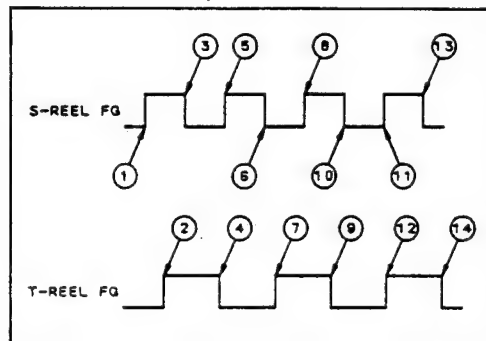


Fig. I-33

② Rec review

When pressing the REC REVIEW button with recording at pause, rec review mode is assumed in which recorded portion is confirmable for about 3 sec as detailed below. On pressing the REC REVIEW button, the tape is played back backward for approx. 3 sec, it is played back forward up to the original location and recording pause status returns. During this time period, the video circuit is set in the JOG mode to insert JOG VD, but audio signal is not output since it is muted.

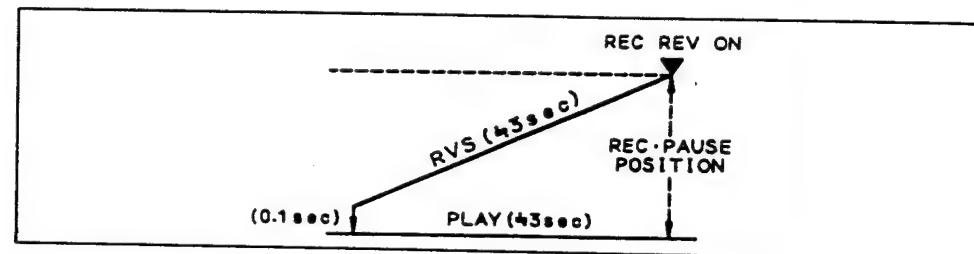


Fig. I-34

③ Edit recording

Edit recording mechanism functions to prevent occurrence of unrecorded portion and tracking error on restart of recording by the start key after its pause. Operational sequence of REC → REC-PAUSE → REC is explained below.

- 1) In case trigger is accepted in the REC mode, it is canceled just when the REF PILOT signal becomes f_3 and reversing brake is applied.
- 2) After about 0.3 sec, the capstan motor starts in the reverse direction to rewind the tape. On this occasion, the tape is moved 3 times as fast as the normal speed.
- 3) The tape is run for approx. 1.3 sec and then brake is applied again.
- 4) Next the tape is transported forward at a threefold speed for approx. 0.6 sec. In this way, the reel pendulum gear is pressed against the takeup reel from the supply reel, thereby preventing the tape from inching and curbing the rise time after releasing pause.
- 5) Brake is applied again to fetch the REC PAUSE status.
- 6) When trigger is accepted in this status, the capstan motor turns on, the tape is run in the playback mode and the ATF servo is activated.
- 7) At about 0.7 sec after start of the capstan motor, recording starts from the field f_3 of ATF.

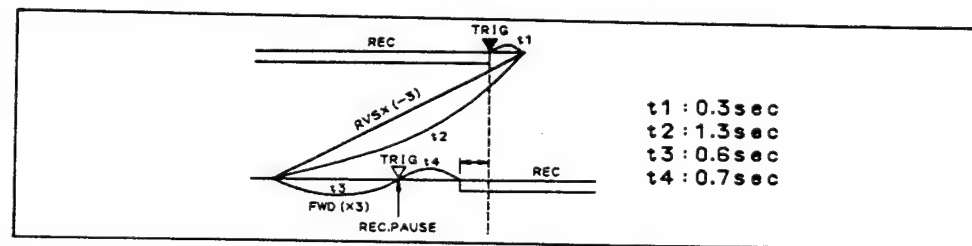


Fig. I-35

④ Full top loading

This VCR effects a special loading on detection of the beginning of tape in the cassette introduced in order to prevent riding onto the drum when loading the beginning of tape. At start of the drum, it is reversed for about 1 sec. Then, the slight brake is applied for the half-loading. By this function, the tape riding can be prevented. (The claw at the upper drum makes the tape off.)

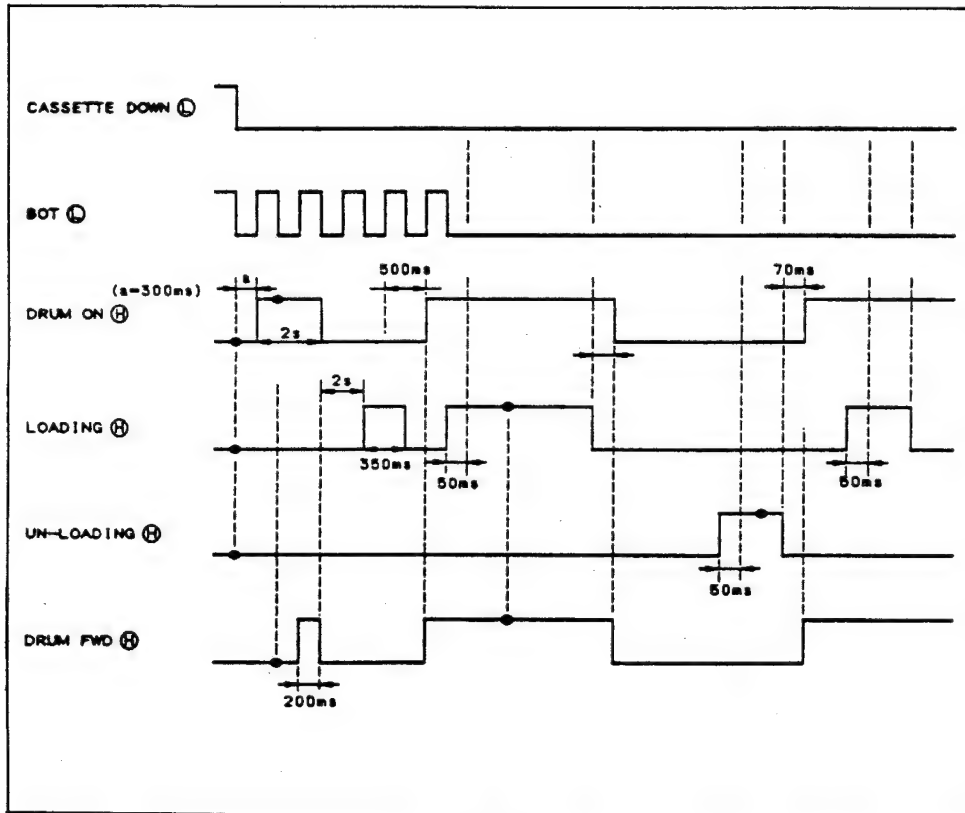


Fig. I-36

⑤ Head Switching in Recording (CT C.B.A.)

In foregoing E70 and E708, the winding angle of the tape to the drum is 180° and the signals are applied to both CH-1 and CH-2 in recording mode without head switching. In E80, the winding angle is changed to 221°, and in recording mode, the head switching is carried out by SW PULSE 1 and 2.

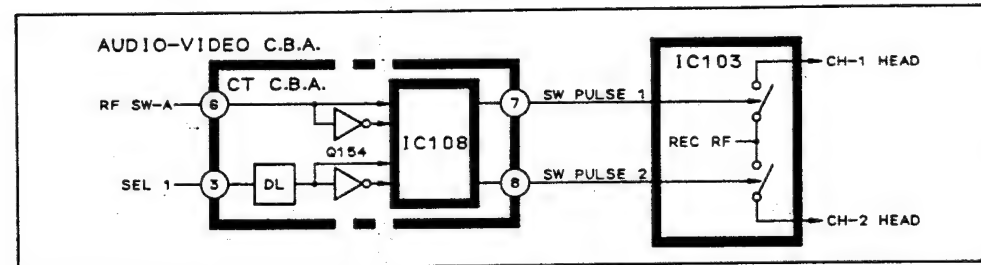


Fig. I-37

The SW PULSE 1 and 2 are generated from the RF SW-A and SEL1. By IC108 and Q154, the ON period of each switch is lengthened according to the time constants determined by R340 and C320 (approx. 3H in front portion).

The Fig. I-38 shows the generating operation for SW PULSE 1 and 2. When the REC SW CONT goes low in recording mode, the SW PULSE 1 and 2 go low to turn the both switches on. In playback mode, as the PB high signal is applied, the SW PULSE 1 and 2 go high to stop the switches off.

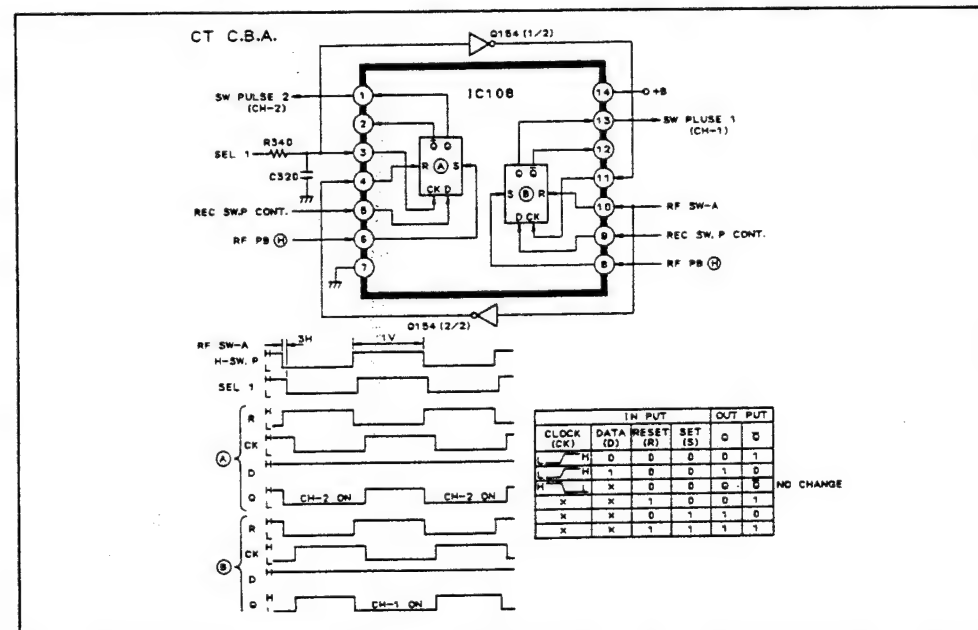


Fig. I-38

⑥ Service modes for recorder unit

This an additional function for facilitating adjustments/repair of recorder unit. With this mode, the recorder unit can be adjusted/repared independently.

1) How to set service mode?

To set the service mode from the usual operation mode, there are two ways as below.

* Modes are shifted sequentially as listed below by pressing the internal switch on the R-KEY board.

How to Set Service Mode?

| Service switch | SERVICE 1 | SERVICE 2 |
|----------------|-----------|-----------|
| Press once | 1-01 | 2-01 |
| Press twice | 1-02 | 2-02 |
| Press 3 times | Normal | 2-03 |
| Press 4 times | 1-01 | 2-04 |
| Press 5 times | 1-02 | Normal |

Table I-12

* SERVICE 2 mode is settable by short-circuiting the pattern of remote controller (WL-E80EXP). This allows operation check without disassembling the main unit. (Remote Controller WL-E80EXP is supplied as service part. DY2-6014-000)

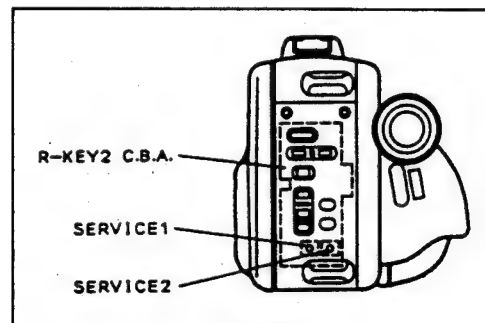


Fig. I-39

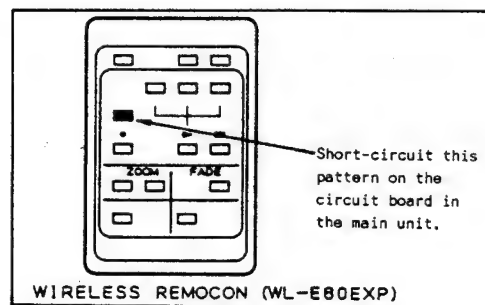


Fig. I-40

2) Service mode functions

[Service mode 1]

Used for adjustment and check of tape traveling section. Duty of head switching pulse is varied so as to make confirmable the inlet and outlet sides of RF envelope.

Functions of Service Mode 1

| Mode | Description | Display | Application |
|--------------|-------------------------------|--|---|
| SERVICE 1-01 | Tracking level reduced by 30% | POWER LED flickers at 0.5 sec intervals. | Tracks can be shifted. Slight adjustment in mechanism driving possible. |
| SERVICE 1-02 | Tracking level at 100% | POWER LED flickers at 1 sec intervals. | Inlet/Outlet of envelope at on-track status confirmable |

Table I-13

[Service mode 2]

Used for electrical adjustment, analysis of trouble stops, check of each sensor and key, etc.

SERVICE 2-01

Enables UNDER CUT and ATF BIAS adjustments.

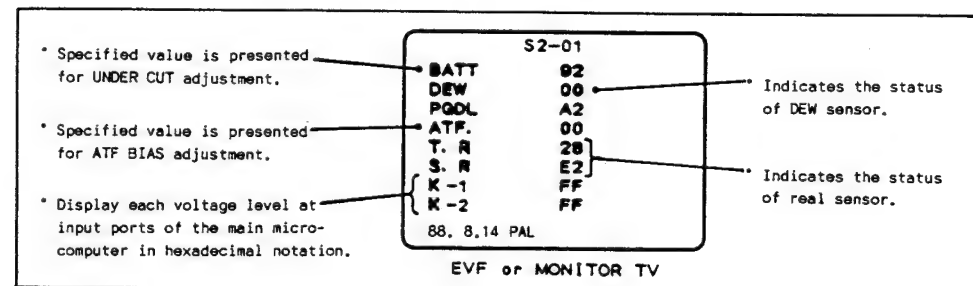


Fig. I-41

SERVICE 2-02

Permits analysis of trouble stops and check of each sensor.

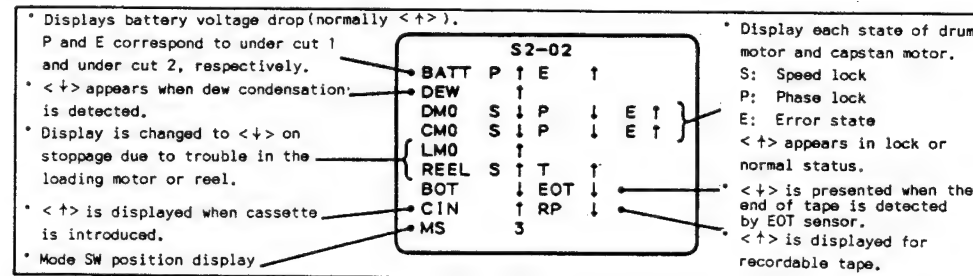


Fig. I-42

SERVICE 2-03

Allows checking the acceptance of recorder key and remote control signals.

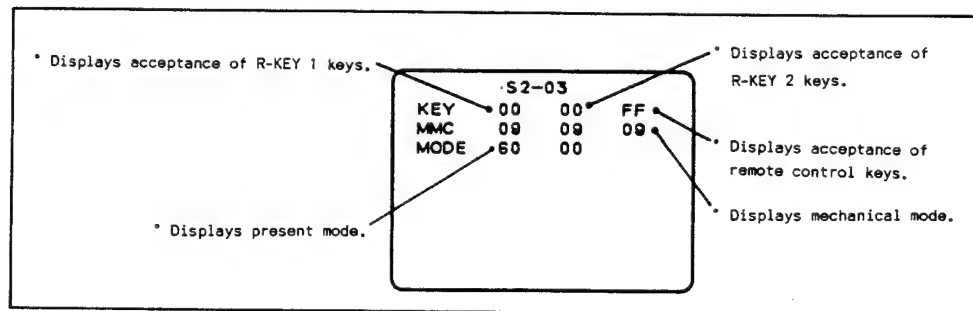


Fig. I-43

SERVICE 2-04

With this mode, the detecting functions below can be canceled.

- Drum rotation error
- Capstan rotation error
- Reel rotation error

(9) Wireless remote controller

The wireless remote controller (WL-E80) has been developed so as to control the E80 remotely.

① Specifications

| | |
|-------------------------|---|
| System | : Infrared-ray wireless controller |
| Data transmission | : With infrared-ray pulse (tuning frequency 37.9 kHz) |
| No. of operation button | : 14 buttons |
| Working distance | : Approx. 5 m |
| Workable range | : Approx. 30° horizontally and approx. 15° vertically |
| Dimensions | : 135 x 58 x 15 mm (L x W x T) |
| Weight | : 55 g (approx.) |
| Battery used | : 2 size-AAA batteries |

② Function

The code to be transmitted consists of a leader section, custom code (16 bits) and data code (16 bits), which is decoded by microcomputer to accept each operation key. In case any key is pressed doubly, data transmission is prohibited to prevent misoperation. [DISPLAY] and [FADE START/STOP] key functions of this controller are unavailable on the main unit.

• [Display] key

Tape counting and mode display are made via line OUT in other than camera recording and line input.

• [Fade start/stop] key

Operable only in usual camera recording mode. Fading proceeds at the timing as shown in the Fig. I-44.

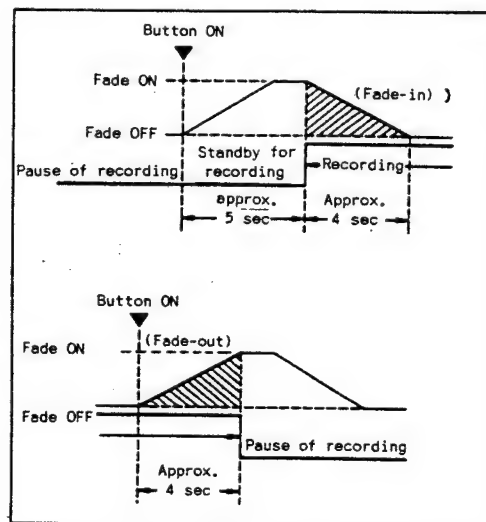


Fig. I-44

(10) Transition of each mode

Transition of Each Mode (Recorder Section)

| MODE KEY | P-OFF | REC-PAUSE | | | | | | | | REC | | | REC-REV | STOP | PLAY | FF | REW | STILL |
|-------------|---------|-----------|-----------------|-----------------------|----------|----------|----------|---------|---------|---------|----------|---------|---------|---------|---------|---------|---------|---------|
| | | NORMAL | SELF1-P. | SELF2-P. | INT10-P. | INT20-P. | INT60-P. | SELF-CD | INT-OPE | NORMAL | SELF-REC | INT-REC | | | | | | |
| POWER | R-PAUSE | P-OFF*1 | P-OFF*1 | P-OFF*1 | P-OFF*1 | P-OFF*1 | P-OFF*1 | P-OFF*1 | P-OFF*1 | P-OFF*1 | P-OFF*2 | P-OFF*2 | P-OFF*3 | P-OFF | P-OFF*4 | P-OFF*4 | P-OFF*4 | P-OFF*5 |
| EJECT | EJECT | EJECT | EJECT | EJECT | EJECT | EJECT | EJECT | X | X | X | X | X | X | EJECT | EJECT | EJECT | EJECT | EJECT |
| TRIGGER | X | REC | SELF1 CD REC | SELF2 CD 30sec.REC | INT-REC | INT-REC | INT-REC | R-PAUSE | R-PAUSE | R-PAUSE | R-PAUSE | R-PAUSE | X | X | STILL | X | X | PLAY |
| REC-REV | X | REC-REV | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| SELF/INT | X | SELF1-P. | R-PAUSE | R-PAUSE | R-PAUSE | R-PAUSE | R-PAUSE | X | X | X | X | X | X | X | X | X | X | X |
| REC | X | X | X | X | X | X | X | X | X | X | X | X | X | R-PAUSE | X | X | X | R-PAUSE |
| STOP | X | STOP | STOP | STOP | STOP | STOP | STOP | STOP | STOP | STOP | STOP | STOP | STOP | X | STOP | STOP | STOP | STOP |
| PLAY | X | X | X | X | X | X | X | X | X | X | X | X | X | PLAY | X | PLAY | PLAY | PLAY |
| FF | X | X | X | X | X | X | X | X | X | X | X | X | X | FF | CUE*6 | CUE*10 | FF | CUE*8 |
| REW | X | X | X | X | X | X | X | X | X | X | X | X | X | REW | REW*7 | REW | REV*11 | REV*9 |
| STIL/PAUSE | X | REC | SELF1 CD REC | SELF2 CD 30sec.REC | INT-REC | INT-REC | INT-REC | R-PAUSE | R-PAUSE | R-PAUSE | R-PAUSE | R-PAUSE | X | X | STILL | X | X | PLAY |

Table I-14(1)

SELF1: SELF, SELF2: SELF 30, INT10: INT. 10, INT20: INT. 20, INT60: INT. 60.

SELF-CD: Self-timer is working (count-down).

INT-OPE: Interval timer is working.

*1: Power off after movement to stop position *2: Power off at stop position after short winding

*3: power off at stop position after completion of rec review *4: Power off at stop position

*5: Power off at stop position after short rewinding

*6: Cue operation while FF button is pressed. Playback upon releasing the button.

*7: REV while REW button is pressed. Playback on releasing the button.

*8: CUE while FF button is pressed. Playback of still frame picture when releasing the button.

*9: REV while REW button is pressed. Playback of still frame picture when releasing the button.

*10: CUE while FF button is pressed. FF when releasing the button.

*11: REV while REW button is pressed. REW when releasing the button.

Transition of Each Mode (Other than Recorder Section)

| MODE KEY | P-OFF | PEC-PAUSE | | | | | | | | REC | | | REC-REV | STOP | PLAY | FF | REW | STILL |
|----------------|-------|-----------|----------|----------|----------|----------|----------|---------|----------|--------|----------|----------|---------|------|------|----|-----|-------|
| | | NORMAL | SELF1-P. | SELF2-P. | INT10-P. | INT20-P. | INT60-P. | SELF-CD | INT-OPE. | NORMAL | SELF-REC | INT-OPE. | | | | | | |
| TITLE | X | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | X | ○ | X | ○ | ○ | X |
| DATE | X | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | X | ○ | X | ○ | ○ | X |
| FADE | X | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | X | ○ | X | ○ | ○ | X |
| FOCUS | X | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | X | ○ | X | ○ | ○ | X |
| AWB/SEPIA | X | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | X | ○ | X | ○ | ○ | X |
| BLC | X | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | X | ○ | X | ○ | ○ | X |
| SHUTTER | X | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | X | ○ | X | ○ | ○ | X |
| T.RETURN | X | X | X | X | X | X | X | X | X | X | X | X | X | ○ | X | X | X | X |
| C.RESET | X | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SP/LP | X | ○ | ○ | ○ | ○ | ○ | ○ | X | X | X | X | X | X | ○ | X | ○ | ○ | X |
| TITLE /DATE | X | ○ | X | X | X | X | X | X | X | X | X | X | X | ○ | X | ○ | ○ | X |
| SHIFT | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| + | X | REC-PLAY | SELF2-P. | INT10-P. | INT20-P. | INT60-P. | SELF1-P. | X | X | X | X | X | X | X | X | X | X | X |
| - | X | REC-RVS | INT60-P. | SELF1-P. | SELF2-P. | INT10-P. | INT20-P. | X | X | X | X | X | X | X | X | X | X | X |

Table I-14(2)

2-3-2 Servo Circuit

The servo circuit is composed of the drum/capstan FG sensor amplifier section, drum/capstan servo section, drum motor driver section, capstan motor driver section and ATF servo section. Operation of each section is outlined below.

(1) Drum/capstan FG sensor amplifier section

FG and PG micro outputs detected through the drum motor and capstan motor, and amplified and waveform-shaped to obtain a logical level (0 to 5 V), which is fed to the drum and capstan servo section. Processing is made in the motor sensor amplifier IC of IC412. Capstan FG frequency is 1325 HZ (SP), 663 Hz (LP) and the drum FG frequency approximates 600 Hz. Because the drum PG is normalized according the rise-point signal of drum FG, operationally two PG pulses are present at an interval of 40 msec from the first rise point of drum FG to the next one.

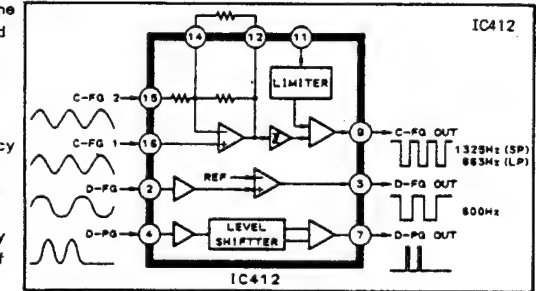


Fig. I-45

(2) Drum/capstan servo section

Main microcomputer takes full charge of servo control. So an external servo circuit is not provided in particular. The hardware of servo system is comprised in IC for software servo implementation.

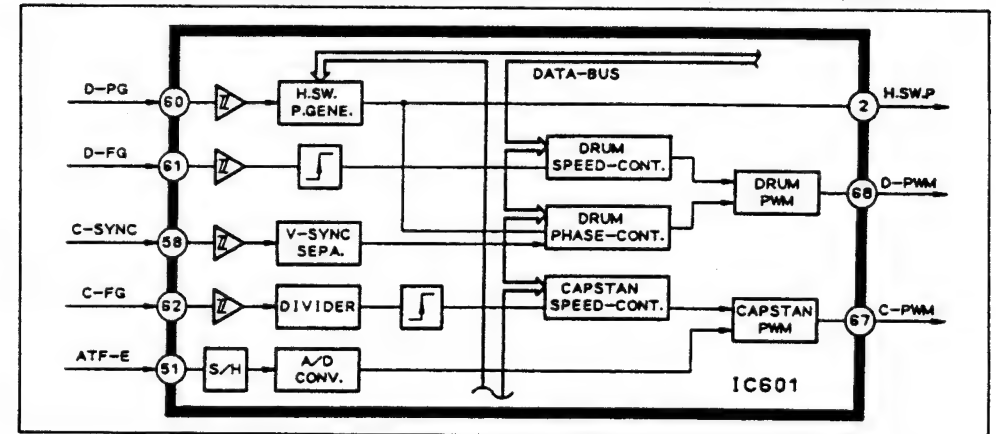


Fig. I-46

* Drum servo system

The drum servo is composed of speed servo and phase servo.

In case of the drum speed servo, FRC is sampled at the rising edge of drum FG applied from pin 61 to calculate an error quantity, which is internally corrected for control.

The drum phase servo depends on the detection of phase difference between the reference signal and drum FG. At playback, 50 Hz signal counted down from clock is used as a reference, and V-SYNC separated from the C-SYNC signal fed to pin 58 is employed at recording.

A free running counter is basically utilized for FG and PG measurement, and error quantity is computed from the difference between the sampling period and internal reference.

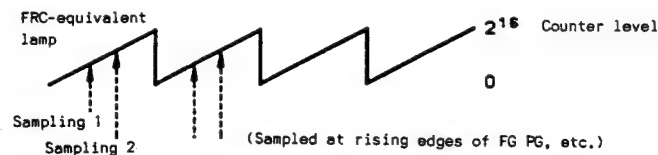


Fig. I-47

• Capstan servo system

This system effects control so that ATF servo is applied at playback and that constant 1325 Hz (SP), 663 Hz (LP) rotation is obtainable at recording. FRC is sampled at the rising edge of capstan FG applied from pin 62 to calculate error quantity, which is subjected to internal correction for controlling the capstan speed. Although the conventional system is equipped with a VR for capstan free speed adjustment, E80 is capable of automatic adjustment.

• Drum fH correction and capstan speed correction

In CUE and REV modes, tape run is different from that in the normal playback mode (9x speed in CUE and -7x speed in REV). To maintain horizontal synchronization, therefore, drum speed is adjusted by 5% (SP), 3% (LP) approx. Although E80 does not incorporate an external correction circuit such as provided with the conventional system, it is able to achieve correction easily just by altering the internal reference. Capstan also undergoes speed correction by means of switchover of the internal frequency demultiplier and alteration of the reference.

• PWM output

Each of drum servo and capstan servo control signals is finally output as PWM signal via pins 67 and 68 of main microcomputer 601. And it is integrated in the integration circuit to generate a DC voltage for motor control as illustrated below.

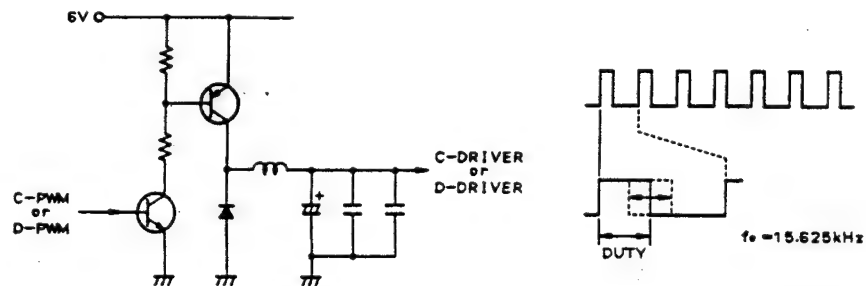


Fig. I-48

(3) Drum motor driver section

The drum motor driver (IC431) is controlled according to PWM power drive output so that the sensorless drum motor is subjected to switching drive. The drum motor is a 3-phase brushless motor which allows energization in only one way.

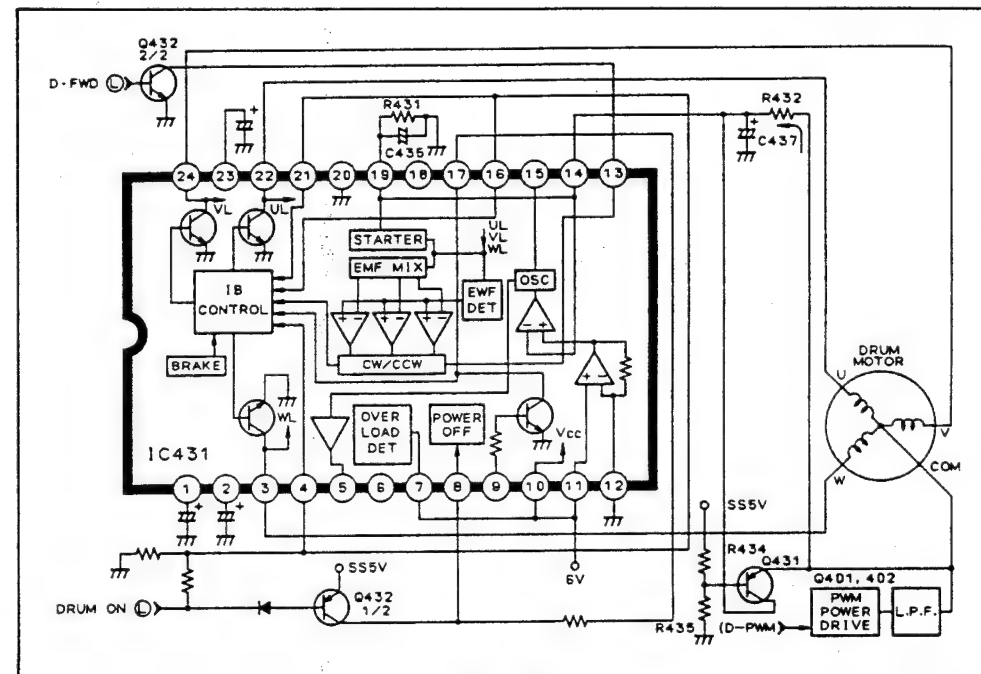


Fig. I-49

The D-PWM signal output from pin 68 of main microcomputer (IC601) receives power drive in Q401 and 402. Then it passes through LPF so as to be converted into a DC voltage and then it is added to the common terminal of drum motor.

Switching among phase W, U and V of drum motor uses pins 3, 22, and 24 of IC431, respectively. Timing of this switching depends on the detection of motor counter-electromotive voltage via pin 14. Motor drive is controlled in response to DRUM ON signal from the main microcomputer. Brake is stopped by using pin terminals 4, 13 and 21 of IC431.

(4) Capstan motor driver section

This section consists primarily of capstan motor driver (IC411). To switch the drive of the motor, the positional detection with a Hall element is carried out by using the PWM power drive output as a control signal. The capstan motor is a 3-phase brushless motor which allows energization in only one direction.

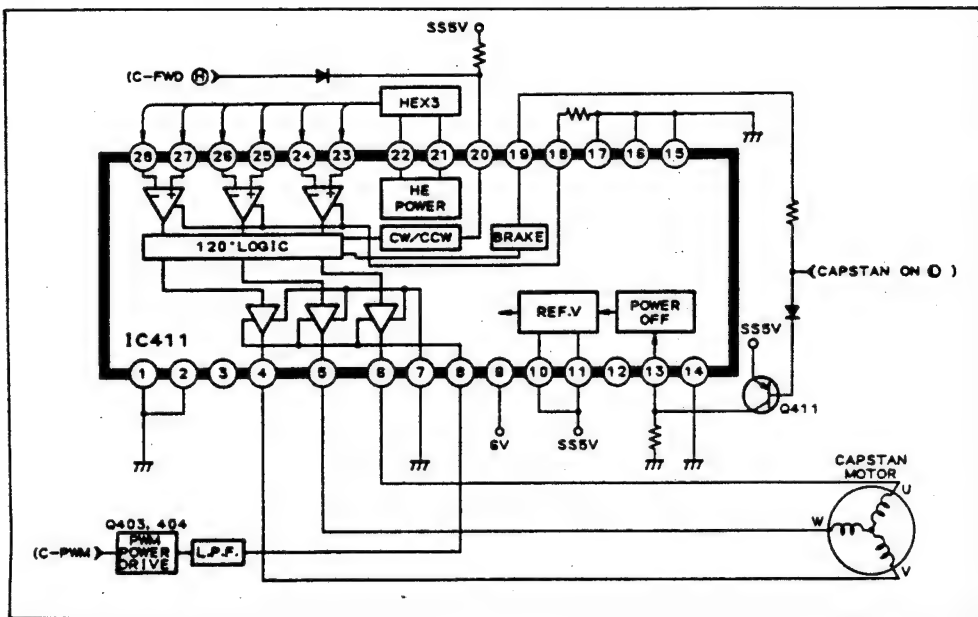


Fig. I-50

The C-PWM signal output from pin 67 of main microcomputer (IC601) is amplified its voltage at Q403 and 404. Then it is converted into a DC voltage through the LPF and fed to pin 8 of IC411, and the voltage is supplied for U, V and W phases. At stoppage, brake is applied by setting pin 19 of IC411 to high.

(5) ATF servo section

ATF servo section is operated by use of IC441 (ATF IC). The ATF pilot signal frequency-multiplexed together with video signal is reproduced to generate capstan phase error signal. This error signal is delivered to the main microcomputer IC601 and mixed with the speed servo, then is output as a PWM signal.

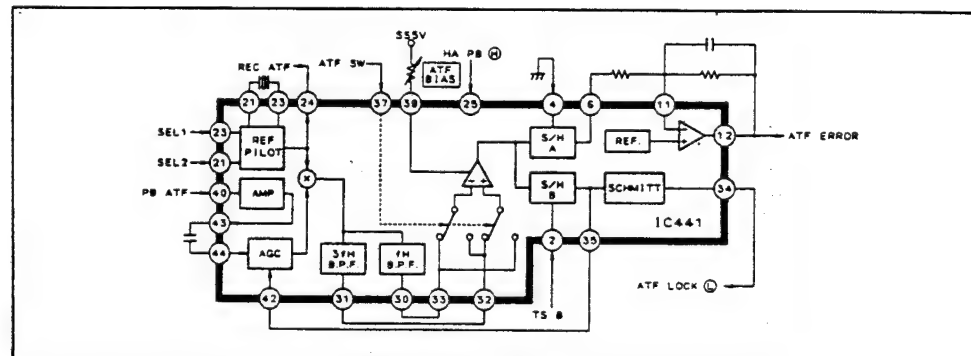


Fig. I-51

- Recording mode

In recording, the reference signal $375 f_H$ in the IC is frequency-divided to generate the REF PILOT signal. Output from pin 24 varies within f_1 to f_4 through combination of SEL 1 and SEL 2 signals applied to pins 21 and 23 of IC441. On this occasion, ATF error output at pin terminal 12 is fixed to about 2.6 V DC.

| SEL 1 | SEL 2 | 1/N | ATF OUT |
|-------|-------|------|---------------------|
| H | H | 1/58 | f_1 (6.5 f_n) |
| L | H | 1/50 | f_2 (7.5 f_n) |
| H | L | 1/36 | f_3 (10.5 f_n) |
| L | L | 1/40 | f_4 (9.5 f_n) |

Table I-16

- Playback mode

At the time of playback, the PB ATF signal fed to pin 40 of IC441 is balance-modulated with the REF PILOT signal generated as in recording. Next, f_H and $3f_H$ components extracted by BPF are compared to detect lead or delay ATF error. The detected signal is transmitted from pin 12 and sampled/held in the main micro-computer.

Comparator output signal is also fed to the S/H B circuit for back lock detection. During the TS B sampling period (\textcircled{L} period), lock detection is made by using the REF PILOT signal before 1 field. \textcircled{L} signal in normal status or \textcircled{H} signal in back lock is sent to the main micro-computer. In case back lock is confirmed, SEL 1 and SEL 2 signals are controlled so as to advance the REF PILOT signal by 2 fields and thereby shorten the phase error correction time.

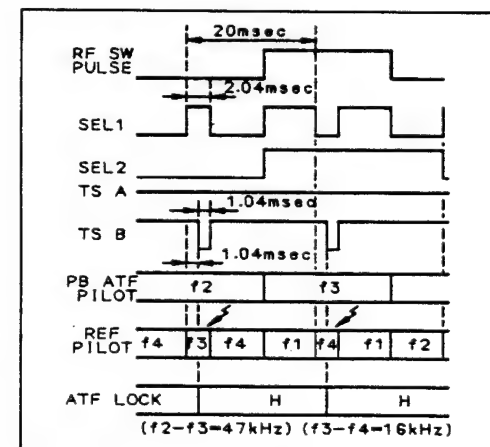


Fig. I-52

* CUE and REV modes

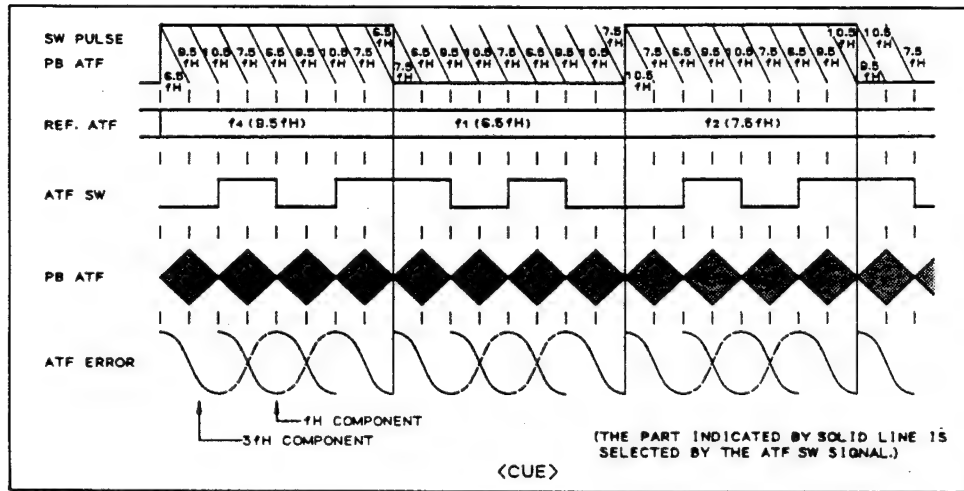


Fig. I-53

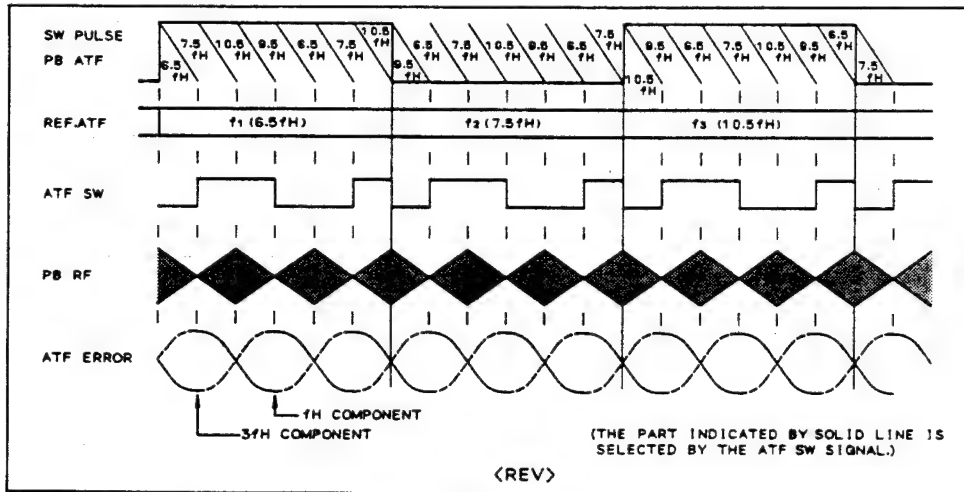


Fig. I-54

In the CUE/REV mode, ATF switch timing is varied so that phase is controlled in response to ATF error which appear in the entire field. This fixes noise bar.

2-3-3 Video Circuit

To process signals, the recorder has heretofore employed different C.B.A.s for the video signal, audio signal and head amplifier. In case of E80, all these cards are integrated to a SINGLE AUDIO VIDEO CBA owing to miniaturization of ICs and chip parts.

(1) Recording

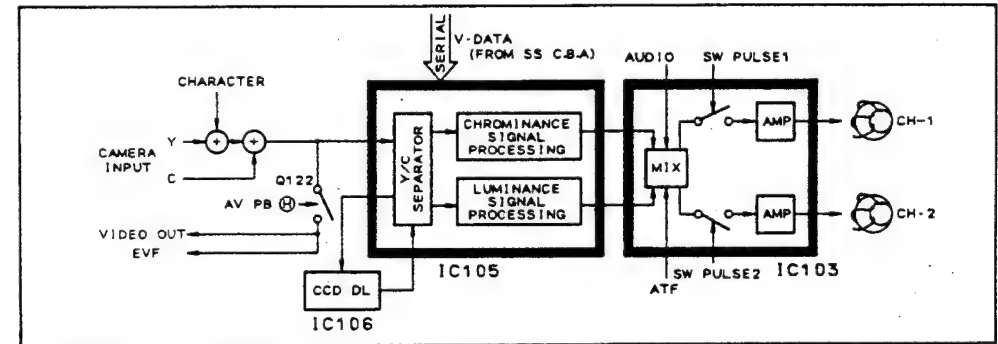


Fig. I-55

Firstly, signals from the camera are mixed in the YC mix circuit for Y/C-separated input. Then the signal is subjected to Y/C separation and modulation in ICs 105 and 106, and then sent to IC103 (recording amplifier).

The output from IC105 is mixed with the recording signals in IC103, and the subsequent switch distinguishes recording between channels 1 and 2 for recording on tape.

(1) Luminance signal circuit

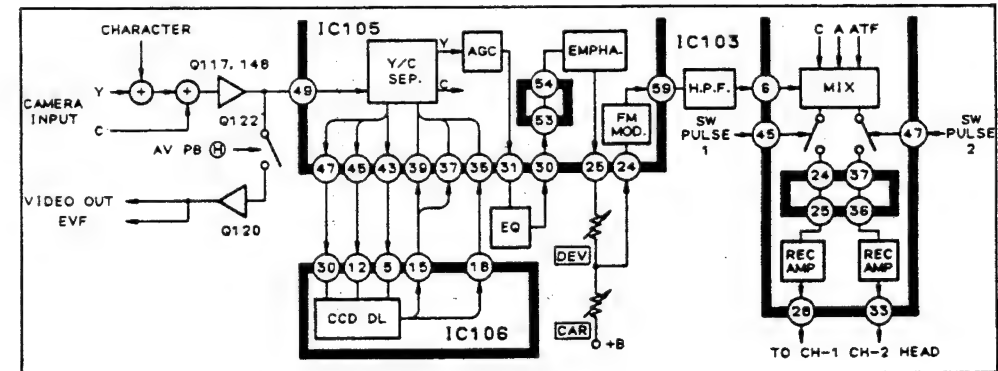


Fig. I-56

Character signal is mixed with the luminance signal from the camera Y/C separator, then, it is mixed with the chrominance signal.

(1) Recording

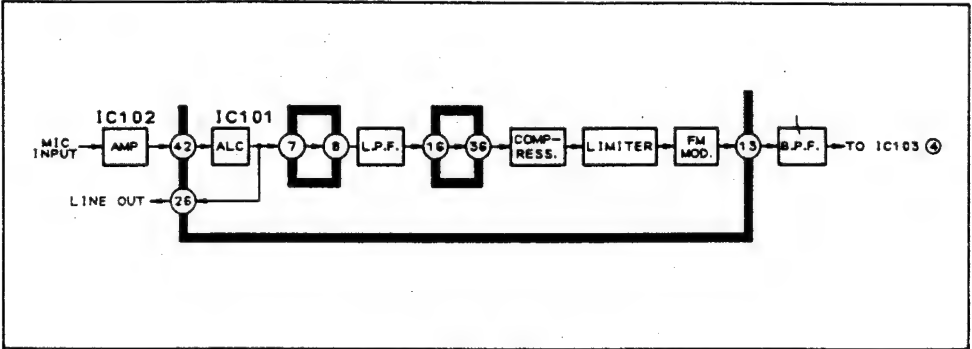


Fig. I-61

Input signal from the microphone is applied to IC101 via the amplifier. The audio signal input to IC101 is regulated in its level to constant at ALC after passing through the selector switch and restricted in its band by LPF. Next, a logarithmic compression is performed for noise reduction, and the level is restricted by the limiter. The signal is frequency-modulated by 1.5 MHz carrier wave and output from IC101. Then, it is input to IC103 after going through BPF to be mixed with other signals, and then recorded on the tape.

(2) Playback

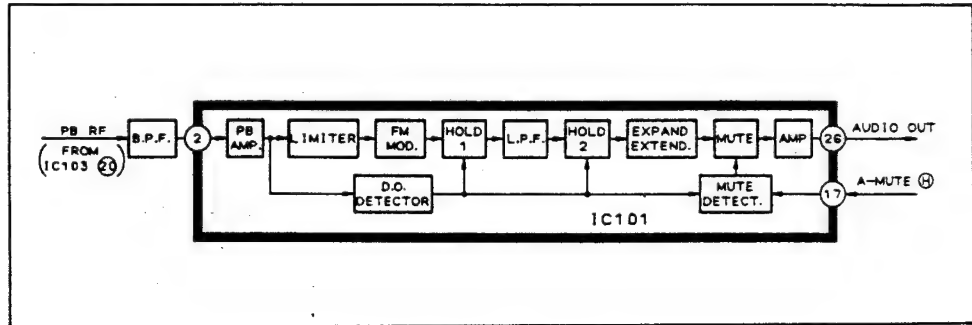


Fig. I-62

1.5 MHz AFM signal is taken out of PB RF signal through BPF, and is input to IC101. Then the AFM signal is amplified by the PB amplifier and the variation of AM portion is removed by the limiter followed by frequency modulation. The other branched output signal from the PB amplifier is used for dropout correction. The demodulated audio signal is fed to Hold-1 circuit to be reduced in its noise level at head switching and then applied to the dropout correction circuit which consists of LPF and Hold-2 circuit. When dropout occurs, it is compensated by Hold-2 circuit. The output signal from Hold-2 is extended in the noise reduction circuit and becomes the original signal again and is output from IC101 via the mute switch.

CHAPTER II. DISASSEMBLING/ADJUSTMENTS

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CHAPTER II. DISASSEMBLING/ADJUSTMENTS

1. Before Disassembling/Adjustments

1-1 List of Maintenance Tools and Supplies

* Note: For recorder mechanical section, refer to the Service Manual for MC-48 issued separately. (DY8-3391-501 201)

Maintenance Tools

| DESCRIPTION | TOOL NO. | REMARKS |
|-------------------------------------|------------------|------------------------|
| Rec. Current Checker | DY9-1056-000 | |
| Alignment Tape E (MONOSCO) | DY9-1062-000 | |
| Alignment Tape G (V DO Adj) | DY9-1064-000 | |
| Y/C Mix Amplifier | DY9-1079-000 | |
| Extension Connector Kit for E80E, F | DY9-1087-500 | New |
| Video Input Adaptor | DY9-1088-500 | New |
| Color Bar Chart | DY9-2002-000 | |
| Registration Chart | DY9-2004-000 | |
| Logarithmic Gray Scale Chart | DY9-2005-000 | |
| Adjuster (0.9 mm) | DY9-2020-000 | |
| Adjuster (1.8 mm) | DY9-2041-000 | New |
| Screwdriver (bit part only) | DY9-2030-000 | |
| Yellow Filter | DY9-2022-000 | |
| Color Chart Viewer (5600°K) | DY9-2039-000 115 | |
| Hexagonal Key Wrench | | Commercially available |
| Color Viewer Lamp (5600°K) | DY9-2040-000 | New |

Table II-1 (1)

Supplies

| DESCRIPTION | TOOL NO. | REMARKS |
|------------------|--------------|---------|
| Screw Lock 1401B | CY9-8012-000 | |
| Grease GE-X8 | CY9-8044-000 | |
| Grease GE-C4 | CY9-8045-000 | |
| Alonalpha | CY9-8007-000 | |
| Grease LT-SH | CY9-8033-000 | |

Table II-1 (2)

1-2 Preparation for Camera Section Adjustments

1-2-1 Setting

* Note: Prepare the Y/C Mix Amp. (DY9-1079-000) and the Extension Connector Kit for E80 E, F (DY9-1087-500).

As the power source, use the DC constant voltage supplier.

(1) Take out the Shield Case 2. (See 2-3 Camera Disassembling.)

(2) Connect the camera unit, the Y/C Mix Amp. and the extension connectors as illustrated below.

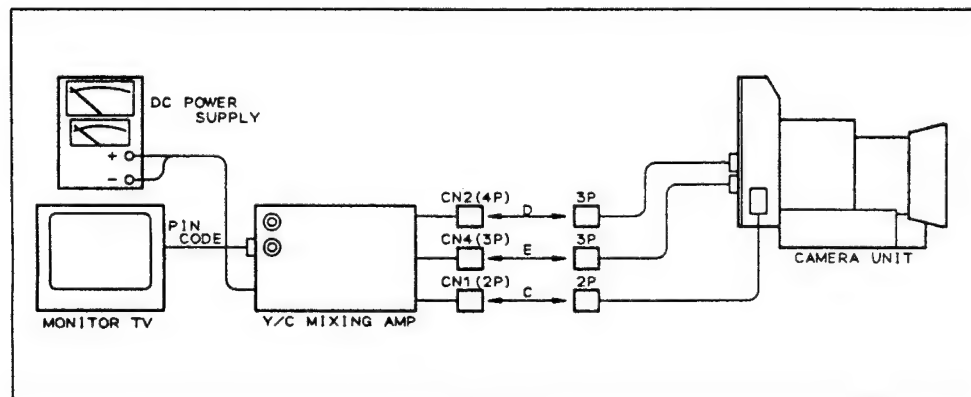


Fig. II-1

1-2-2 Basic Check

* Note: Picture quality deteriorates when the extension connectors are connected.
Never perform the adjustment at this state.

(1) Prepare the Extension Connectors Kit (DY9-1087-500) and connect them as illustrated below.

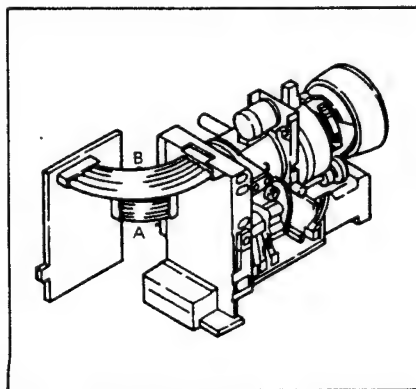


Fig. II-2

1-2-3 Other Preparation for Camera Adjustments

(1) Before adjustments, warm up the camcorder for more than 3 minutes.

(2) Use a light box of 5600°K temperature.

(3) Make a frame chart as illustrated in Fig. II-3.

(4) Set the standard angle of view for each chart as follows.

* Grayscale/Colorbar charts

Set the standard angle of view by using a full scan monitor or an oscilloscope.

To make a standard angle of view with a full scan monitor, shoot the chart full in the screen. (Fig. II-3)

To make a standard angle of view with an oscilloscope, set the range to 20 μ s (video signal) as shown in Fig. II-3 and align the each center of chart and screen.

* Window chart and Frame chart

Take its image with center aligned at the same standard angle of view as for the grayscale chart.

* White chart (white paper)

Shoot at its center.

* Camera Electrical Adjustments

Except for blooming adjustment, set an object distance at 1.4 m approx..

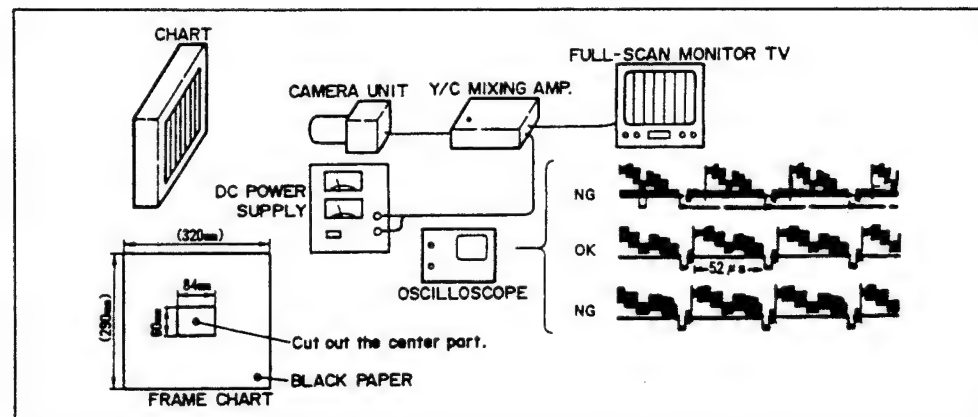


Fig. II-3

1-3 Preparation for Recorder Section Adjustment

1-3-1 Setting (Overview)

- * Notes: 1. When setting, be careful not to break the claw at left cover.
2. To facilitate the tape travel adjustment, etc., the recorder section can be operated independently with an extension connector F. (At this state, characters are not displayed on monitor TV.)

(1) Prepare the following connector of Extension Connector Kit for E80 (DY9-1087-500).

F: Power supply connector for recorder section

(2) Prepare the Video Input Adaptor (DY9-1088-500)

(3) Plug each connectors as follows. (Fig. II-4)

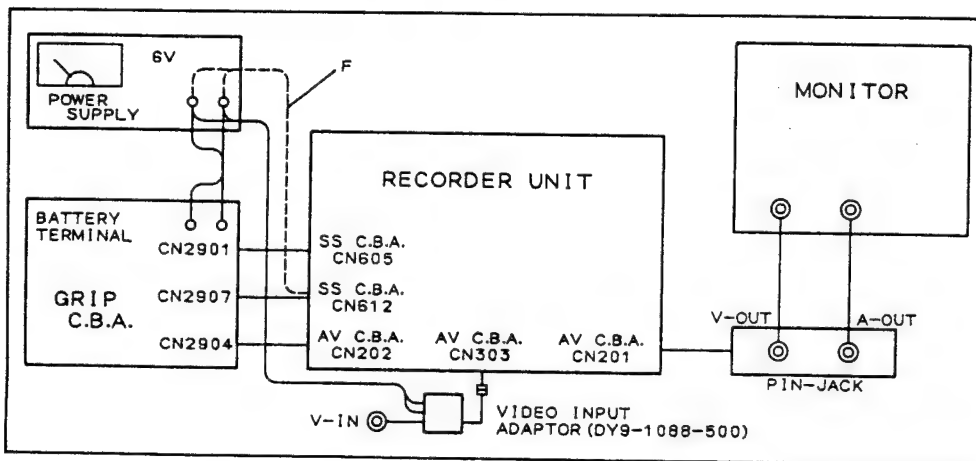


Fig. II-4

1-3-2 How to Check C.B.A.s

- (1) Remove two setscrews securing the AV C.B.A. and the recorder holder.

* Remarks: At this state, almost of all electrical checks (recorder section) can be performed.

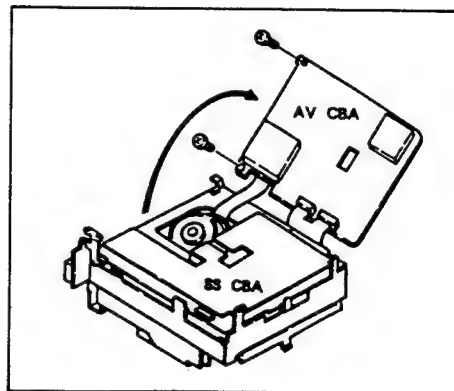


Fig. II-5

(2) Remove two setscrews securing the SS C.B.A..

(3) To open the C.B.A., use the following connectors of Extension Connector Kit for E80.

* Remarks: At this state, the checking of rear side of mechanism can be performed.

I: Extension connector for drum motor (1 pc.)

J: Extension connector for T reel (1 pc.)

K: Extension connector for S reel (1 pc.)

L: Connector for I & K (2 pcs.)

M: Connector for J (1 pc.)

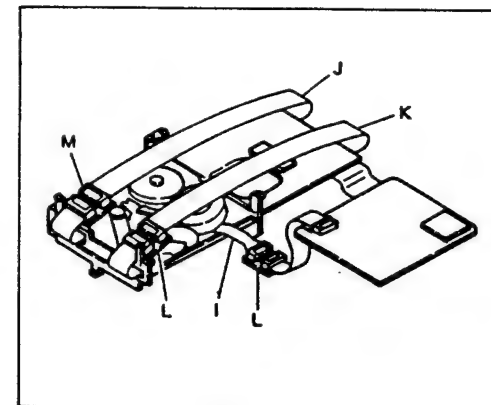


Fig. II-6

1-3-3 Setting (Actual view)

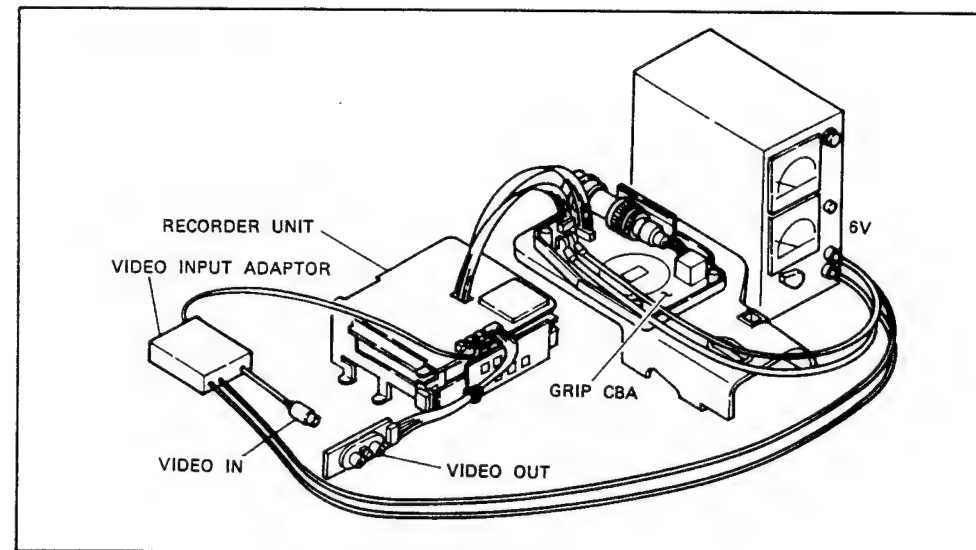


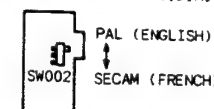
Fig. II-7

1-3-4 Character Indication

The character can be displayed either in English or French with a SW002 of Recorder Key 2 C.B.A..

When the Recorder Key 2 C.B.A. is replaced, switch SW002 over to the language according to your necessity.

RECORDER KEY 2 C.B.A.



1-3-5 Service Modes

Service modes are provided for the adjustment and operational checks as follows.

(1) * Service Mode 1

With these modes, the adjustments/checks at tape pass section can be performed. (The duty ratio of switching pulse is changed.)

- 1) SERVICE 1-01
Track shifting mode for tape travel checks. (70% on-track)
- 2) SERVICE 1-02
On-track (100%) mode for RF envelope check.

* Service Mode 2

With these modes, the adjustments/checks at system control servo section, each motors and the sensors can be performed as follows.

- 1) SERVICE 2-01 : Undercut adjustment/ATF bias adjustment can be performed.
- 2) SERVICE 2-02 : State at each sensor, motor and mechanisms can be checked.
- 3) SERVICE 2-03 : Each key input and state at remote control system can be checked.
- 4) SERVICE 2-04 : Error/abnormal check functions can be cancelled. (i.e. drum/capstan motors, reels.)

(2) Setting

Push the SERVICE 1 and 2 switches on R-KEY 2 C.B.A. to set the above service modes. According to the time pushed, the each mode changes as follows.

By shorting the pattern of remote control, the service modes, can be set, too. At this state, each operational checks can be performed without disassembling the unit.

Note: When a remote control system is used, SERVICE 2 only can be set. For details, refer to "6 Service Mode" in page I-42.

| Times to be pushed | 1-time push | 2-time push | 3-time push | 4-time push | 5-time push |
|--------------------|-------------|-------------|-------------|-------------|-------------|
| SERVICE 1 | 1-01 | 1-02 | Normal | 1-01 | 1-02 |
| SERVICE 2 | 2-01 | 2-02 | 2-03 | 2-04 | Normal |

Table II-2

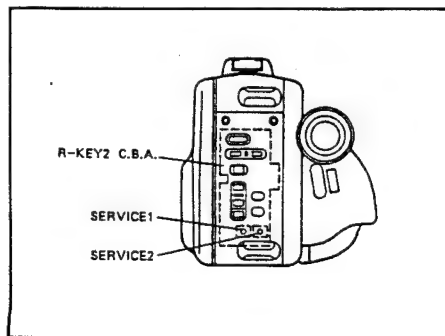


Fig. II-8

2. Disassembling/Reassembling

2-1 Removal/Reassembling of Covers

2-1-1 Removal of Eyepiece, Microphone and Lithium Battery Cover

- (1) Take off the eyepiece and the microphone.
- (2) Take off the lithium battery cover.

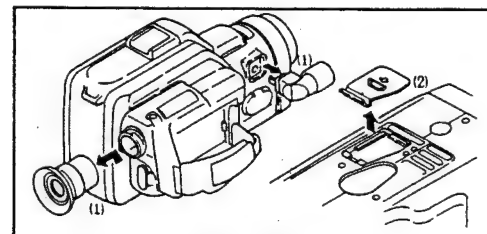


Fig. II-9

2-1-2 Removal of Cassette Cover

- (1) Peel off two cassette cover seals.
- (2) Remove two setscrews (a).
- (3) Take off the cassette cover while sliding it toward the direction indicated by the arrow mark.

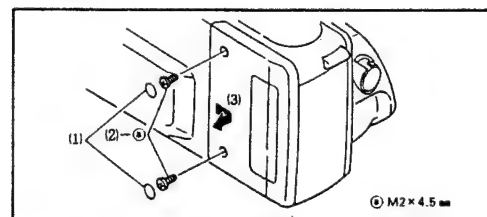


Fig. II-10

2-1-3 Removal of Left Grip Cover

- (1) Turn the grip downward by 90°. Then remove two setscrews (c) on the rear side.
- (2) Remove two setscrews (c) on the front.
- (3) Take off the left grip cover.

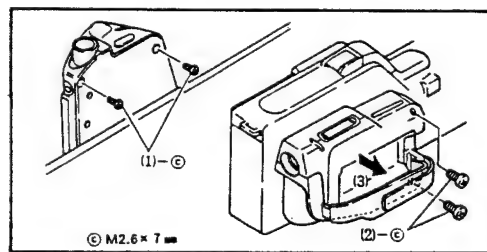


Fig. II-11

2-1-4 Removal of Left Cover

- (1) Unplug the three connectors between the unit and grip.
- (2) Remove seven setscrews (a) and three setscrews (b).
- (3) Set the zoom lever to wide angle position.
- (4) Remove the left cover from the rear side (1). Then, while pulling the visible light cutoff filter slightly toward front (2), take off the left cover (3). At this time, be careful not to damage the rubber ring.
- (5) Unplug three connectors from the left cover.

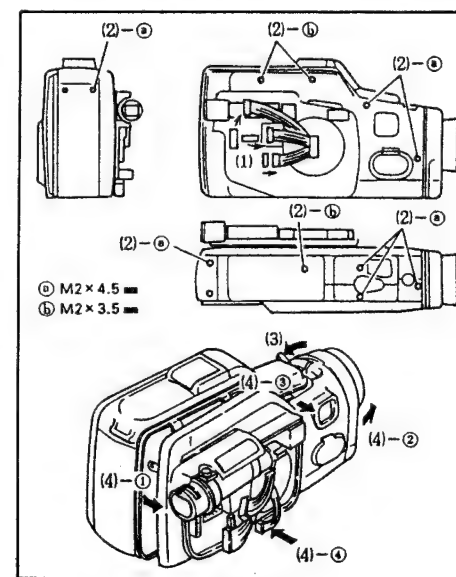


Fig. II-12

2-1-5 Removal of Visible Light Cutoff Filter

- (1) While pressing the index line part (1), remove the visible light cutoff filter (2).
- (2) Remove the rubber ring.

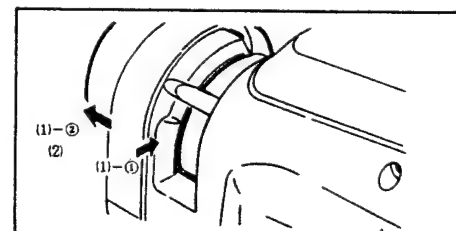


Fig. II-13

2-1-6 Removal of Top Cover

- (1) Remove three setscrews (a).
- (2) Take off the top cover.

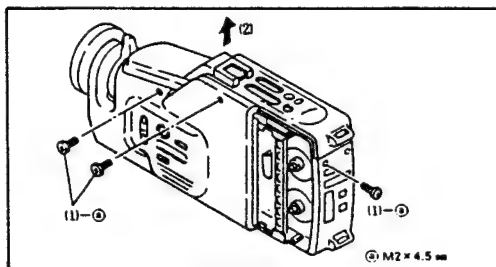


Fig. II-14

2-1-7 Removal of Camera and Recorder Units

- (1) Remove a screw (d).
- (2) Unplug eight connectors between the camera and the recorder units.
- (3) Take out the camera and the recorder units.
- (4) Separate the camera and the recorder units.

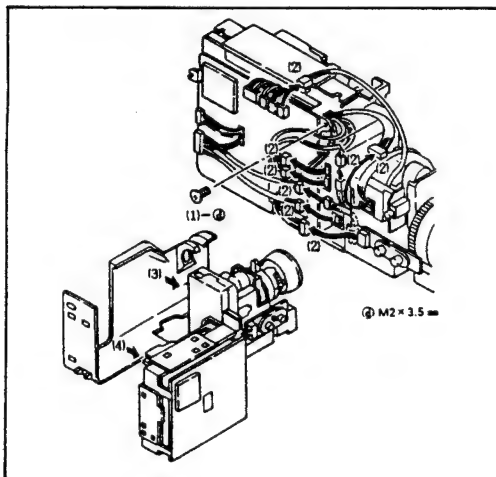


Fig. II-15

2-1-8 Removal of Grip C.B.A.

- (1) To unplug the connector between T/W Power Switch and EVF, shift the CRT. Then, unplug the connector.
- (2) Remove three setscrews (a).
- (3) Take out the Grip C.B.A.

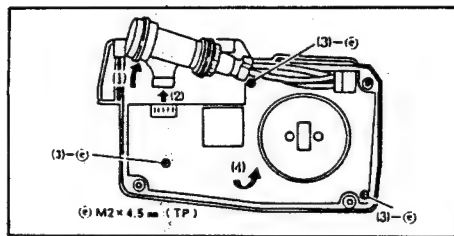


Fig. II-16

2-1-9 Removal of Grip Right Cover

- (1) Remove two setscrews (f).
- (2) Take off the grip right cover.

* Note: * When replacing a steel ball/plate, apply Grease (LT-SH CY9-8033-000).
* When replacing a screw (f) apply Screw Lock 1401B (CY9-8012-000).

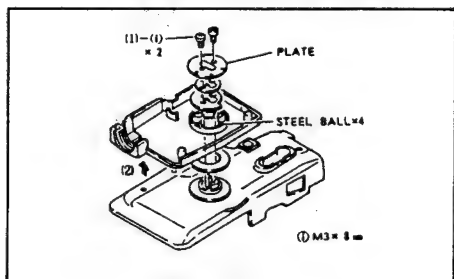


Fig. II-17

2-1-10 Removal of Rear Cover

- (1) Remove a screw (a).
- (2) Take off the rear cover.

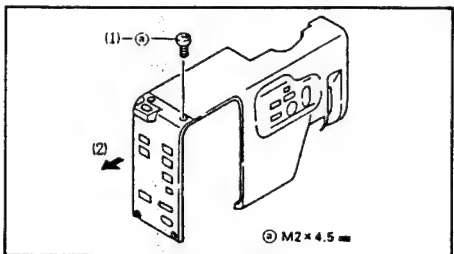


Fig. II-18

2-1-11 Reassembling of Covers

When reassembling, perform the reverse procedures of disassembling.
For a visible light cut-off filter and a rubber ring, install them after reassembling the left cover.

2-2 Disassembling of Lens Section

2-2-1 Removal of AF C.B.A.

- (1) Unplug the four connectors listed below.
AF C.B.A. ↔ PZ motor
AF C.B.A. ↔ AF MOTOR
AF C.B.A. ↔ SPC C.B.A.
AF C.B.A. ↔ IRED C.B.A.
- (2) Remove a screw.
- (3) Take out the AF C.B.A..

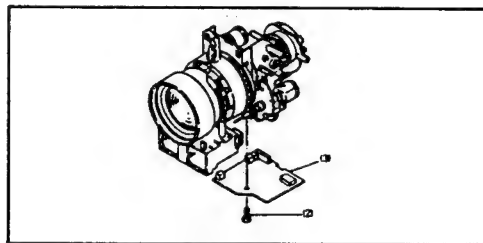


Fig. II-19

2-2-2 Removal of AF and PZ Motors

- (1) Remove two setscrews.
- (2) Demount the AF and the PZ motors.

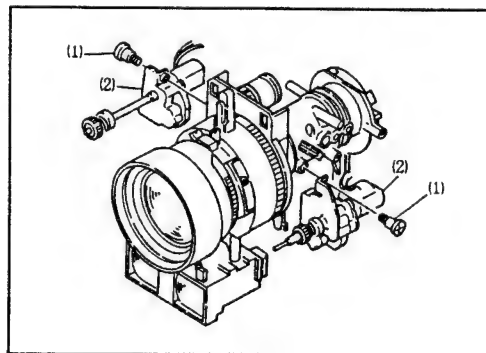


Fig. II-20

2-2-3 Removal of AF Block

- (1) Remove two setscrews.

* Note: The setscrew hole on IRED mount side is covered with a tape. When reassembling, be sure to reattach the tape.

- (2) Detach the AF block.

* Notes: 1. If the prism is turned excessively, or undue pressure is exerted on it, the shaft holding springs (two thin wire springs) may come off.
2. When reattaching the AF block, make sure that the focusing ring cam surface (A) is interlocked with the prism arm (B) properly.
3. After remounting the AF block, be sure to adjust the AF distance measuring function.

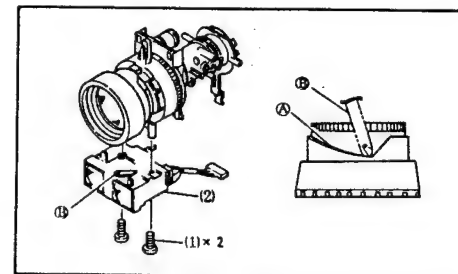


Fig. II-21

2-2-4 Removal of Relay lens

- (1) Remove a screw.
- (2) Take out the relay lens a'ssy..

* Note: After remounting the relay lens a'ssy., be sure to perform back-focus adjustment.

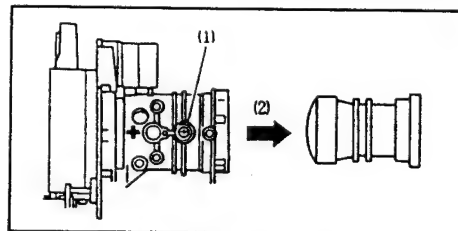


Fig. II-22

2-2-5 Removal of IG Meter

- (1) Remove the IG cover.
- (2) Remove a screw.
- (3) Demount the IG meter.

* Note: When detaching/attaching, be careful not to deform the diaphragm blades. Remember that the diaphragm blades are likely to come off its dowels. To avoid it, check that the diaphragm blades are secured correctly.

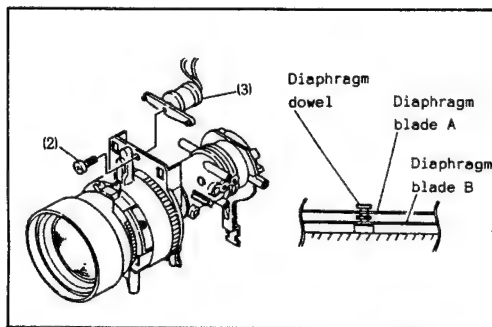


Fig. II-23

2-2-6 Removal of Diaphragm Blades A and B

* Note: Be extremely careful not to bend or contaminate the diaphragm blades. Never touch the diaphragm blades with bare hand or fingers.

- (1) Remove the IG meter.
- (2) Align the part (a) of diaphragm blade A with its dowel position, then detach the diaphragm blade A.
- (3) Detach the diaphragm B in the same manner.

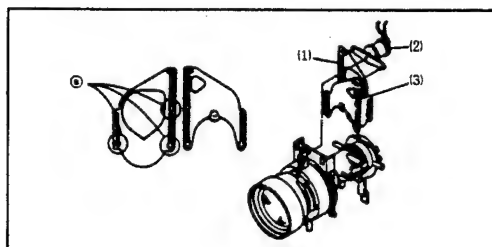


Fig. II-24

2-2-7 Removal of Zoom Sheet

- (1) Peel off the zoom sheet using tweezers or equivalent.

* Note: When reattaching the zoom sheet, take care not to make it creased or kinked.

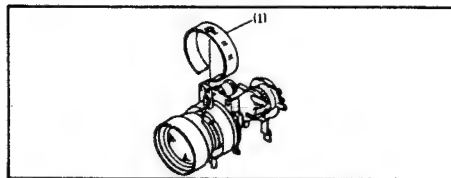


Fig. II-25

2-2-8 Removal of Zoom Ring

- (1) Take out the AF block, AF C.B.A. and the PZ motors.
- (2) Remove the N stopper. Demount the focus lens a'ssy..
- (3) With the focus side facing down, remove the setscrews securing the relay holder and the fixed lens barrel.
- (4) With the fixed lens barrel mounted, turn the focus side up.
- (5) Set the zoom rings to the telephoto-end position. Then, remove the variator retaining plate spring and setscrew.
- (6) While pulling up the fixed lens barrel (A) straight gradually, take out it together with the cam ring (B) and the zoom ring (C).
- (7) Remove the zoom ring and the cam ring from the fixed lens barrel.

* Note: Take care not to let the compensating spring (D) pop astray.

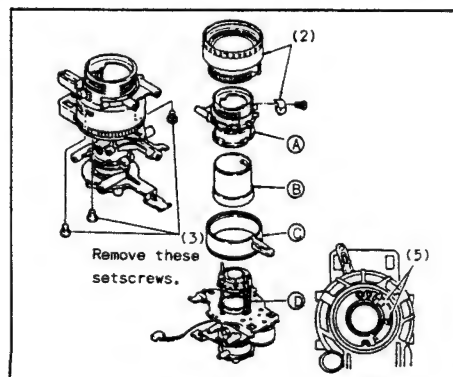


Fig. II-26

2-2-9 Replacement of Zoom Ring (Refer to Fig. II-26)

- (1) Attach the cam ring and the zoom ring to the fixed lens barrel.
- * Note: Engage the cam ring with the part (E) of the zoom ring.
- (2) Set the zoom lever to position (H). Mount the fixed lens barrel straight gradually.
- * Note: Align the zoom shafts (F) x 3 with the positioning holes (G) on the fixed lens barrel.
- (3) Set the zoom ring to the telephoto end position. Attach the variator retaining plate spring. (See Fig. II-26 (5))
- * Note: To make sure that the zoom ring can be turned smoothly, move the zoom ring between telephoto end and wide-angle end repeatedly.
- (4) While taking care not to allow the fixed lens barrel to come off, turn the focus side down.
- (5) Secure the fixed lens barrel to the relay holder with three setscrews.
- (6) Mount the focus lens a'ssy. on the fixed lens barrel.
- (7) Attach the N stopper to the fixed lens barrel.
- (8) Install the AF block, AF C.B.A., AF motor and PZ motor.
- (9) Check each section if operates properly.
- (10) Perform AF distance measuring adjustment. If deviated, adjust it.

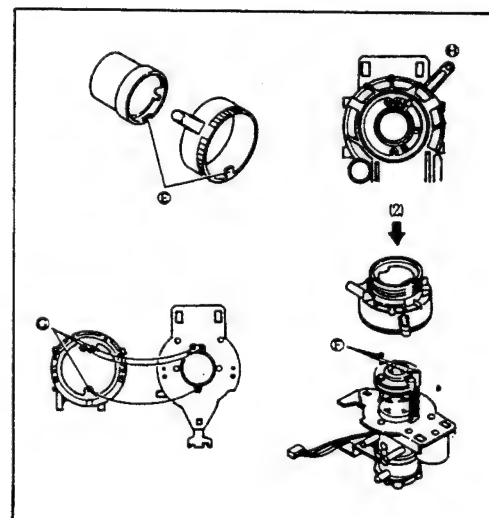


Fig. II-27

2-3 Disassembling of Camera Section

2-3-1 Removal of Shield Case 2

- (1) With the connectors plugged, detach the Camera Key C.B.A..
- (2) Remove a screw (a). Then, detach the CCD radiation plate.
- (3) Detach the DC/DC converter.
- (4) Unsolder five soldering points of shield case.
- (5) Take off the Shield Case 2.

* The camera electrical adjustments can be performed, if DC/DC converter is attached at this state.

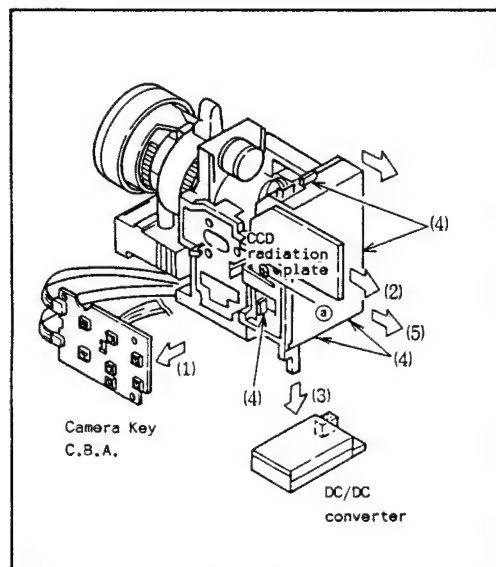


Fig. II-28

2-3-2 Removal of Camera Holder 1 and Process C.B.A.

- (1) Unplug three connectors of Camera Key C.B.A..
- (2) Unplug the connector of Process C.B.A.. Then, take off the Process C.B.A..
- (3) Remove a screw (a). Then take off the Camera Holder 2.
- (4) Remove three setscrews (b). Then take off the Camera Holder 1.

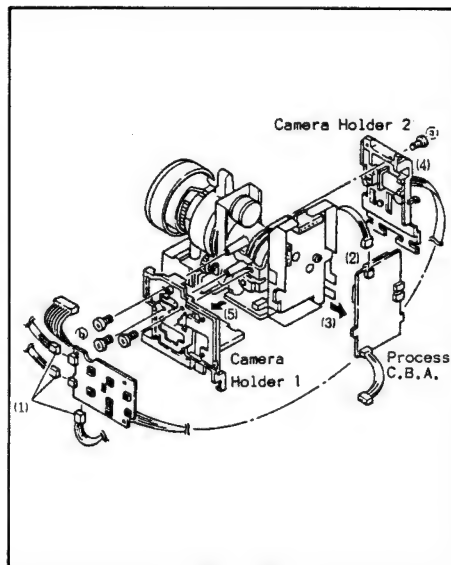


Fig. II-29

2-3-3 Separation of Lens and Sensor C.B.A.

- (1) Remove two setscrews (a). Then, separate the lens section and the Sensor C.B.A..
- (2) Unsolder three points which fix the Sensor C.B.A. and the Shield Case 1.
- (3) Unsolder the solderings at pins of CCD.
- (4) Remove two setscrews (b). Then, separate the CCD holder and the Sensor C.B.A..

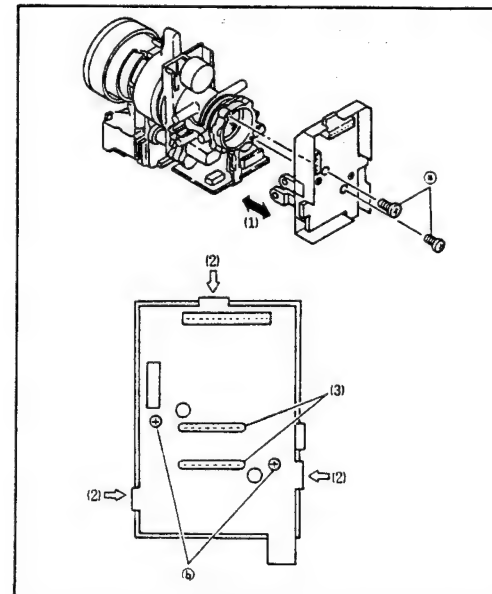


Fig. II-30

2-3-4 Removal of CCD Holder

- (1) Peel off the insulation sheet.
- (2) Remove two setscrews (a).
- (3) Disassemble the CCD holder section.

* Note: When reassembling, pay utmost attention to the direction of CCD and the crystal filter.
When reassembling CCD, push the CCD a little in the direction of (A) in the figure. Then, fix it with a CCD Support Plate.

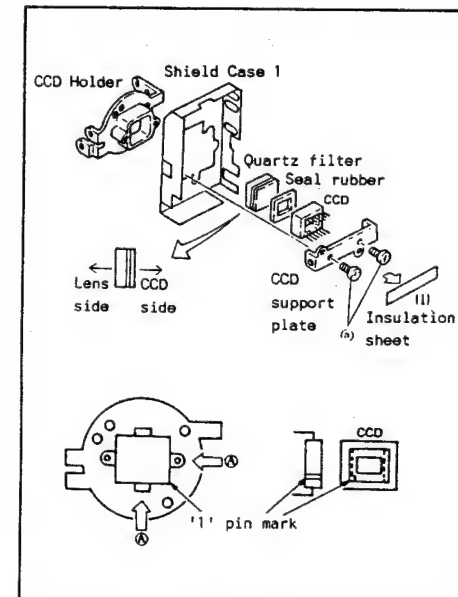


Fig. II-31

2-4 Disassembling of Recorder Section

2-4-1 Removal of R-KEY 1 and 2 C.B.A.s

- (1) Remove two setscrews (a).
- (2) Take off R-KEY 1 and 2 C.B.A.s.

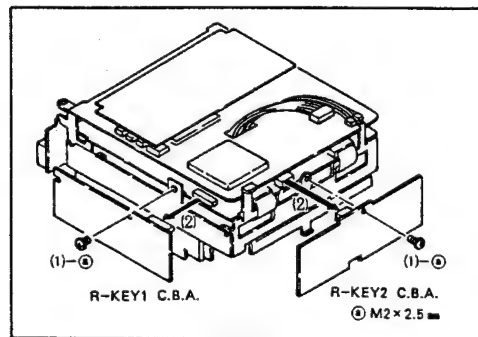


Fig. II-32

2-4-2 Removal of Audio and Video C.B.A.

- (1) Remove two setscrews (b).
- (2) Remove the shield case and plate. Then, unplug CN301.
- (3) While opening the Audio and Video C.B.A., unplug CN605 and 612.
- (4) Unplug CN302 and 303. Then, take off the Audio and Video C.B.A..

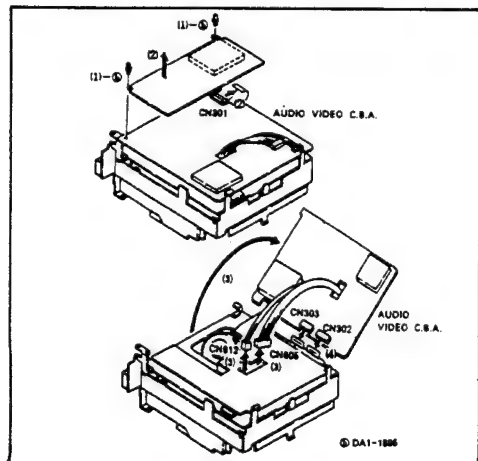


Fig. II-33

2-4-3 Removal of Syscon Servo C.B.A.

- (1) Remove two setscrews (a).
- (2) Unplug CN401, 411, 431, 601, 604, 608 and 609.
- (3) Take off the Syscon Servo C.B.A..

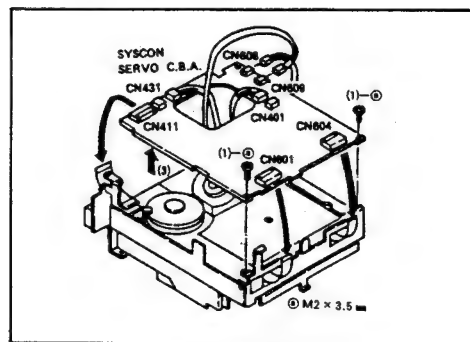


Fig. II-34

2-4-4 Removal of Recorder Holder

- (1) Remove two setscrews (a). Then, take off the recorder holder 3.
- (2) Remove a screw (c). Then, take off the recorder holder 2.
- (3) Remove a screw (a). Then, take off the recorder holder 4.
- (4) Unplug the connector which is connected to the capstan motor.
- (5) Remove two setscrews (d). Then, take off the recorder holder 1.

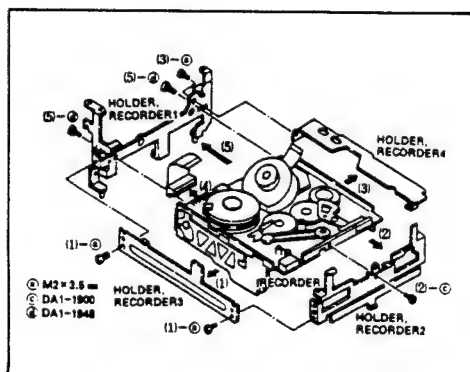


Fig. II-35

3. Adjustments (Lens Section)

3-1 Back Focus Adjustment (T/W Zoom Correction)

| | |
|--------|-------------------------------------|
| CHART | Siemens chart located 3 meters away |
| M. EQ. | Monitor TV |
| TOOL | Phillips screwdriver |
| ADJ. | Focusing ring relay lens |

* Note: Open the aperture fully as possible.

- (1) Loosen the screw (a).
 - (2) With telephoto-end zoom setting, bring the pattern image into focus by turning the focusing ring.
 - (3) With wide angle end zoom setting, put the pattern image into focus by moving the relay lens back and forth.
 - (4) Repeat the above steps (2) and (3) to remove defocusing at telephoto and wide angle ends.
 - (5) Tighten the screw (a).
- * Note: When tightening, be careful not to shift the relay lens from the correct position.
- (6) Check the AF distance measurement function.

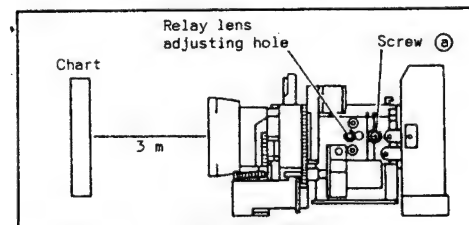


Fig. II-36

3-2 SPC Parallax Adjustment

| | |
|--------|---|
| CHART | SPC Parallax adjustment chart (equivalent to that used for VM-E2) |
| M. EQ. | Monitor TV, Light box |
| TOOL | Phillips screw driver (DY9-2030-000) |
| ADJ. | SPC C.B.A. |
| SPEC. | Align SPC position with beam from light box |

* Note: Prepare the chart shown in Fig. II-37.

- (1) Place the adjustment chart on the light box and shoot it three meters from the front lens.
 - (2) Align the center of chart image with that of monitor TV, then bring the chart image into focus.
 - (3) Loosen two setscrews (a).
- * Note: Before tightening setscrews (a), clean Screw Lock to prevent wrong positioning of SPC C.B.A..

- (4) Moves SPC C.B.A. to align with the beam from the light box. At this step, adjust the vertical position mainly. Then, tighten two setscrews (a).
- (5) Apply Screw Lock to two setscrews.

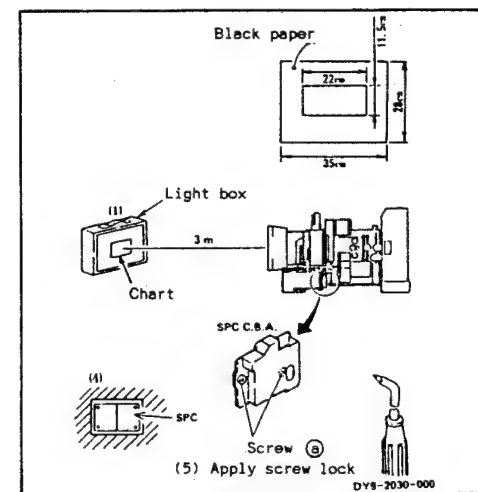


Fig. II-37

3-3 AF Distance Measurement Adjustment

| | |
|--------|--|
| CHART | Siemens chart, 60% or higher reflectance chart |
| M. EQ. | Monitor TV |
| TOOL | Screwdriver, section paper, index strip |
| ADJ. | AF distance adjusting screw (a). |
| SPEC. | +0.75 mm -1.0 mm |

* Note: Open the aperture fully as possible.

- (1) Attach the section paper and the index strip as shown in Fig. II-38.
- (2) Shoot the siemens chart from three meters away.
- (3) With telephoto-end setting, bring the chart image into best focus. Then, mark the relevant index position on the section paper.
- (4) Replace the siemens chart with the 60% or higher reflectance chart.
- (5) Mark the center AF stop position between the infinity and nearest ends on the section paper.
- (6) Check a difference between the positions marked at steps (3) and (5) is within the specified range.
- (7) If not, carry out adjustment by turning screw (a).

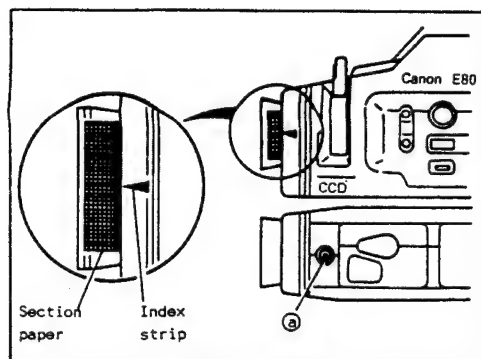


Fig. II-38

3-4 Preparation for Lens Focus Adjustment

* Note: For this adjustment, pick up an actual scene at infinity (65 meters or more away), or use a collimator.
(Near subject cannot be used for this adjustment)

Described below is the preparator procedures for using the single-lens reflex camera and lens (focal length: 300 mm or more recommended) instead of a collimator.

| | |
|-------|---|
| CHART | Ground glass (30 mm x 40 mm, approx.) |
| TOOL | Single-lens reflex camera, lens (focal length: 200 mm or more, magnifier) |

- (1) Open the aperture of single-reflex camera fully. Then, open the rear lid.
- * Note: If the shutter equips the valve mechanism, lock it for opening the aperture. If not (e.g. Canon T series etc.), open the aperture by using the slow shutter and take out the internal battery immediately while the shutter is opened.
- (2) Secure the ground glass to the inside rail face by pressing it. At this step, the ground surface should face the lens side.
- (3) Shoot a scene at infinity. To check if it is in best focus, enlarge the image on the ground glass through the magnifier.
- * Note: Distance for infinity: See Fig. II-39.
- (4) After the above checking, remove the ground glass once and mark cross hairlines on it. Then, attach it to the camera again.

*Note: Using this substitute for collimator, the back focus adjustment (T/W zoom correction), 3-1 can be performed with high accuracy within a short time.

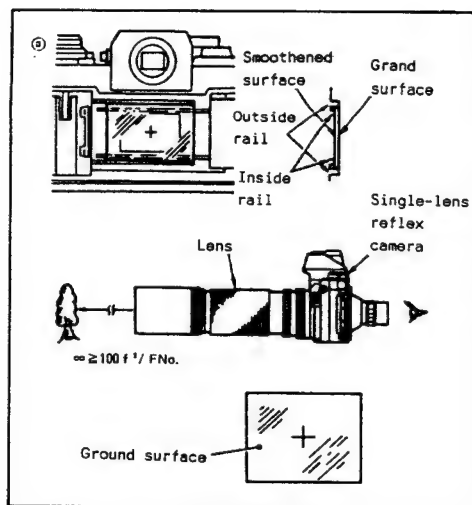


Fig. II-39

3-5 Lens Focus Adjustment

* Note: Perform this adjustment only when the focus lens a'ssy. is replaced.

Described below is the adjustment procedure for using the single-lens reflex camera instead of a collimator.

| | |
|--------|--|
| CHART | Ground glass (30 mm x 40 mm, approx.) |
| M. EQ. | Monitor TV |
| TOOL | Single-lens reflex camera, lens (focal length: 200 mm or more), Phillips screwdriver |
| ADJ. | Focusing lens, relay lens |
| SPEC. | Within 1/3 of infinity (∞) (+0.5 mm) |

- (1) Engage the concave helicoid with the focusing ring.
- (2) Remove the N Stopper, and take out the focus lens a'ssy..
- * Notes: 1. When reassembling, do not exert undue force at screwing-in, or the thread may be damaged.
2. When reassembling, apply grease specified.
- (3) Align the optical axis of VM-E80 lens with that of single-lens reflex camera as accurately as possible. (Visual alignment)
- (4) With telephoto-end zoom setting, adjust focus using the front lens. At this time, hold the focusing ring to the infinity (∞) stop position, and turn the concave helicoid until the best focus is obtained.

- (5) Loosen the screw (a).
- (6) Move the relay lens back and forth with wide angle end to bring the object into best focus.
- (7) Repeat steps (4) and (6) until the object is into best focus both in wide and telephoto ends.
- (8) Lock the relay lens and confirm that the object is into best focus.
- (9) Confirm that the focusing ring is butted onto the stopper at infinity side. Then, fix the focusing ring and the concave helicoid with an instantaneous adhesives specified. (Aronalphi)

* Notes: 1. Do not apply adhesive excessively and also be careful not to drop it onto the other positions except indicated. (esp. AF cam part (b))
2. Do not touch forcibly for five minutes after application.

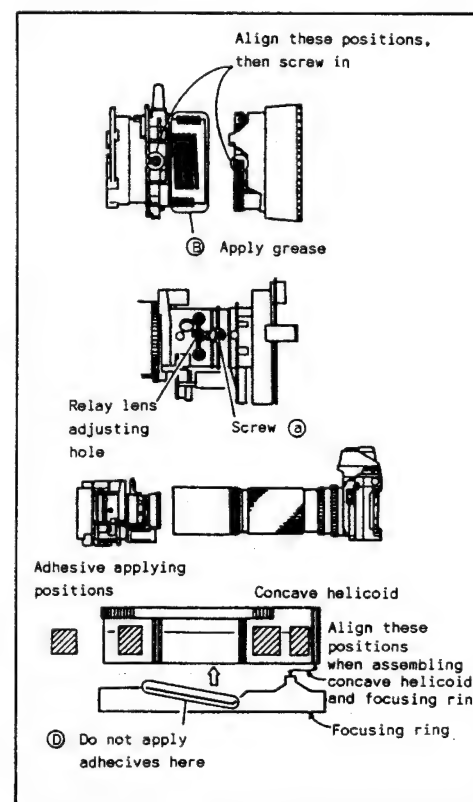


Fig. II-40

3-6 Oil/Grease/Bond Application Positions

* Note: After cleaning, replacing, etc., apply the followings to the indicated positions in the figure.

1. Grease GE-X8
2. Grease GE-C4
3. Instantaneous adhesive Aronalphi
4. Screw Lock

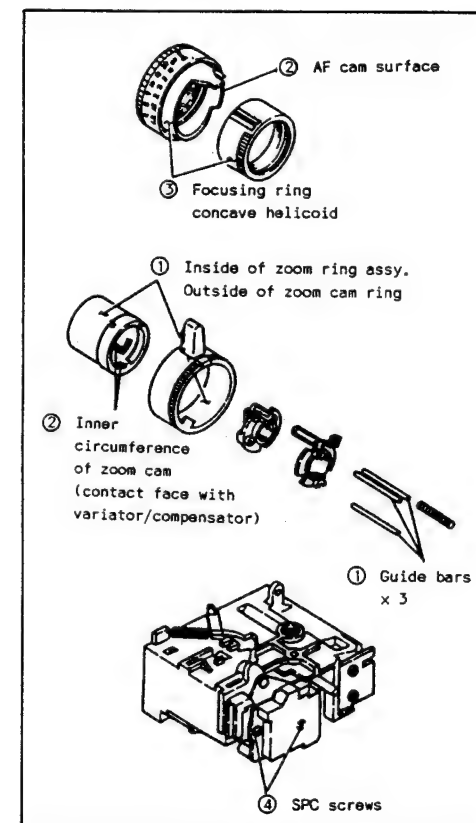


Fig. II-41

4. Adjustments (Camera Section)

Note: For the following adjustments from 4-3 to 4-12, set the PRESET mode.
To set it, connect TP2220 (W.B. PRESET) and TP2216 (+5V).

4-1 Clock Frequency Adjustment

| | |
|----------|--------------------------------------|
| M. EQ. | Frequency counter |
| | *Connect via oscilloscope |
| TP/TRIG. | PRO C.B.A. TP2207(SP2)P TP2202(GND)V |
| ADJ. | SNES C.B.A. VC2001(CLOCK) |
| SPEC. | 4.828125MHz \pm 0.000015MHz |

4-2 PLL Adjustment

| | |
|----------|---------------------------|
| M. EQ. | Digital voltmeter |
| TP/TRIG. | TP2209(PLL)T TP2202(GND)V |
| ADJ. | SENS C.B.A. VC2202(PLL) |
| SPEC. | 2.5V \pm 0.1V |

4-3 Auto Iris Adjustment

* Note: After adjustment, move iris from lens-closed to opened to confirm the specification obtained.

| | |
|----------|-------------------------------|
| CHART | Greyscale |
| MODE | AWB PRESET |
| M. EQ. | Oscilloscope |
| TP/TRIG. | TP2203(Y IRIS)Q/TP2208(FH/2)S |
| ADJ. | PRO C.B.A. VR2201(IRIS) |
| SPEC. | 250 \pm 10mV |

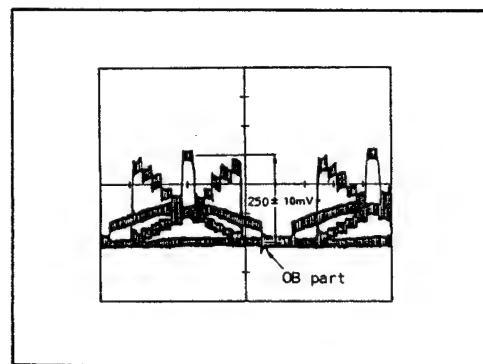


Fig. II-42 10 μ s/10 mV

4-4 OB Set Adjustment

| | |
|----------|---|
| CHART | lens closed |
| MODE | AWB PRESET |
| M. EQ. | Oscilloscope |
| TP/TRIG. | TP2204(Y AGC)R/TP2208(FH/2)S |
| ADJ. | PRO C.B.A. VR2202(OB SET) |
| SPEC. | Levels of waveform and blanking centers to be the same. |

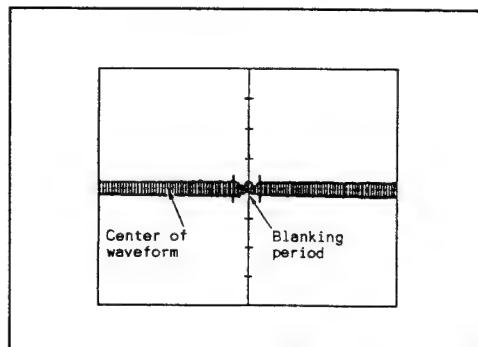


Fig. II-43 10 μ s/10 mV

4-5 V Aperture Adjustment

| | |
|----------|------------------------------|
| CHART | Greyscale |
| MODE | AWB PRESET |
| M. EQ. | Oscilloscope |
| TP/TRIG. | TP2212(V.APA)J/TP2208(FH/2)S |
| ADJ. | VR2204(V.APA) |
| SPEC. | Minimize signal component |

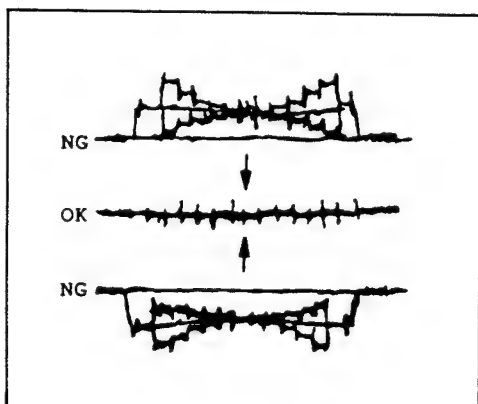


Fig. II-44 10 μ s/10 mV

4-6 Y Level Adjustment

* Note: Before adjustment, release the white clip.
Use the waveform having higher center peak.

| | |
|----------|------------------------------|
| CHART | Greyscale |
| MODE | AWB PRESET |
| M. EQ. | Oscilloscope |
| TP/TRIG. | TP2213(Y OUT)I/TP2208(FH/2)S |
| ADJ. | VR2203(Y LEVEL) |
| SPEC. | 1220 \pm 20mV |

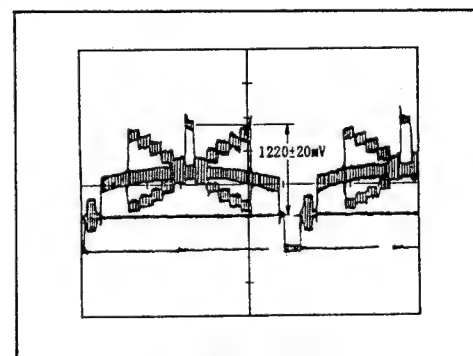


Fig. II-45 10 μ s/50 mV

4-7 White Clip Adjustment

| | |
|----------|------------------------------|
| CHART | Window chart |
| MODE | AWB PRESET |
| M. EQ. | Oscilloscope |
| TP/TRIG. | TP2213(Y OUT)I/TP2208(FH/2)S |
| ADJ. | VR2303(W.CLIP) |
| SPEC. | 1400 \pm 20mV |

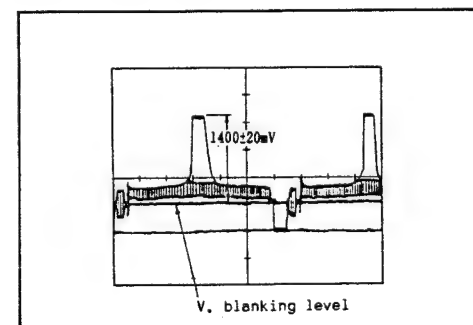


Fig. II-46 10 μ s/50 mV

4-8 Color Difference Gain Adjustment

| | |
|--------|--------------------------|
| CHART | Color bar |
| MODE | AWB PRESET |
| M. EQ. | Vectorscope |
| ADJ. | VR2207(C1H LEVEL) |
| SPEC. | Each dots to be together |

* Note: If the above specification not obtained, the followings can be tolerated.
Burst level = dG 15%

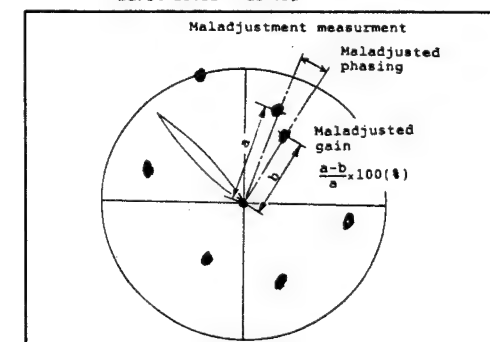


Fig. II-47

4-9 Carrier Balance Adjustment

| | |
|--------|--------------------------------------|
| CHART | Greyscale |
| MODE | AWB PRESET |
| M. EQ. | Vectorscope |
| ADJ. | VR2301(B-Y C.B.) VR2304(R-Y C.B.) |
| SPEC. | Bright dots to be centered |

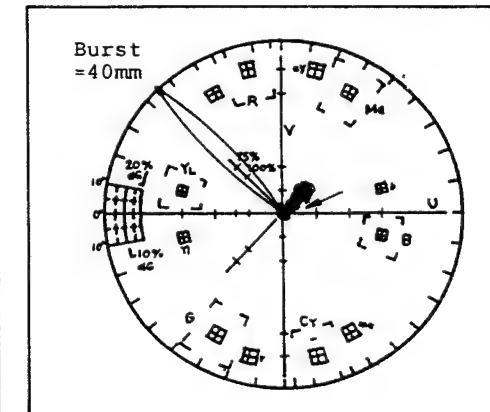


Fig. II-48

4-10 Modulation Axis Adjustment

| | |
|--------|---|
| CHART | Colorbar |
| MODE | AWB PRESET |
| M. EQ. | Vectorscope |
| ADJ. | VC2301(SC90) VR2306(BURST PHASE) |
| SPEC. | Make each bright dots into one as possible. |

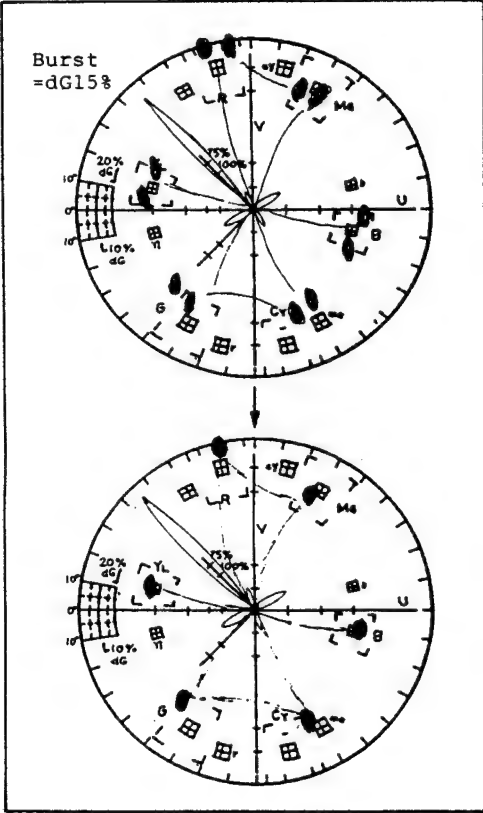


Fig. II-49

4-11 White Balance Adjustment

| | |
|--------|---------------------------------|
| CHART | Grayscale |
| MODE | AWB PRESET |
| M. EQ. | Vectorscope |
| ADJ. | VR2205(R WB) VR2206(B WB) |
| SPEC. | Minimize bright dot as possible |

4-12 Color Balance Adjustment

* Note: Adjust R's phase and gain mainly.

| | |
|--------|---|
| CHART | Colorbar |
| MODE | AWB PRESET |
| M. EQ. | Vectorscope |
| ADJ. | VR2302(B-Y LEVEL) VR2305(R-Y LEVEL) |
| SPEC. | Color Phase Gain (burst ratio) R $106 \pm 2^\circ$ 1.5 ± 0.1 times Ye $166 \pm 4^\circ$ 1.0 ± 0.2 times G $240 \pm 8^\circ$ |

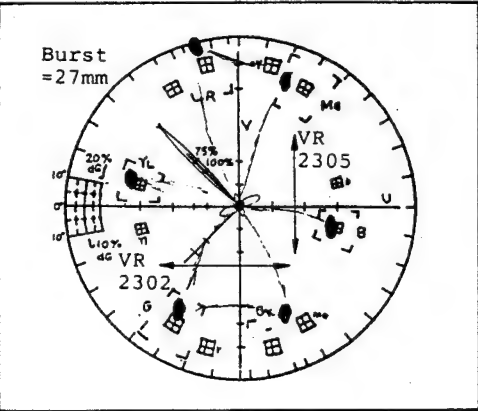


Fig. II-50

4-13 Full Auto White Balance Adjustments 1 and 2

| | |
|--------|--------------|
| CHART | White chart |
| M. EQ. | Vectorscope |
| TOOL | Halogen lamp |

* Full Auto White Balance Adjustment 1

| | |
|-------|--|
| MODE | FAWB R-Y CH PRO. C.B.A. TP2217(CH SEL)G ↔ TP2215(GND)E TP2219(FL TEST)F ↔ TP2215(GND)E TP2220(WB PRESET)B ↔ TP2215(GND)E |
| ADJ. | VR2601(AWB R-Y) VR2604(AWB B-B) |
| SPEC. | Set bright dot to position in Fig. II-51 ①. |

* Full Auto White Balance Adjustment 2

| | |
|-------|---|
| MODE | FAWB B-Y CH PRO. C.B.A. TP2217(CH SEL)G ↔ TP2216(+5V) TP2219(FL TEST)F ↔ TP2215(GND) TP2220(WB PRESET)B ↔ TP2215(GND) |
| SPEC. | Set bright dot to position in Fig. II-51 ②. |

Procedures:

- * Note: Turn VR gradually.
- 1) Shoot white chart with halogen lamp lighted.
 - 2) Set each bright dots as in Fig. II-51, respectively.

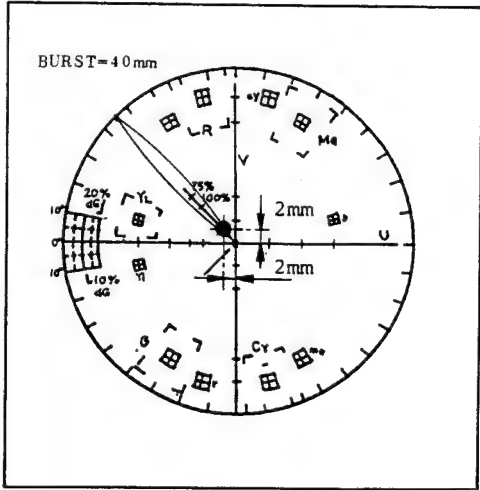


Fig. II-51

4-14 Full Auto White Balance Adjustment 3

| | |
|--------|---|
| CHART | White chart |
| M. EQ. | Vectorscope |
| TOOL | Halogen lamp |
| MODE | FAWB R+B PRO. C.B.A. TP2217(CH SEL)G ↔ TP2215(GND)E TP2219(FL TEST)F ↔ Open TP2220(WB PRESET)B ↔ TP2215(GND)E |
| ADJ. | VR2603(AWB R+B) |

Procedures:

- * Note: Do not turn VR excessively.
- 1) Shoot white chart with halogen lamp lighted.
 - 2) Shift bright dot in direction of B-Y +.
(VR2603)
 - 3) Turn VR2603 reversely to above direction until bright dot comes to the position in Fig. II-52.

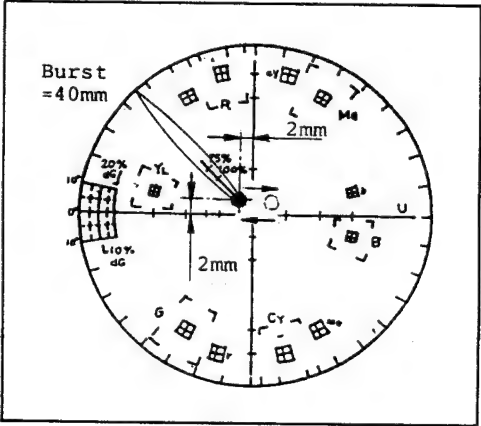


Fig. II-52

4-15 Chrominance Clip Adjustment

| | |
|--------|-------------------------|
| CHART | Frame chart (page II-3) |
| MODE | AMB PRESET |
| M. EQ. | Vectorscope |
| TOOL | Yellow filter |
| ADJ. | VR2209(C CLIP) |

Procedures:

- 1) Shoot frame chart with standard angle of view.
- 2) Attach an yellow filter (DY9-2022-000).
- 3) Set burst to 27 mm.
- 4) Shift bright dot from the position (a) to (b).

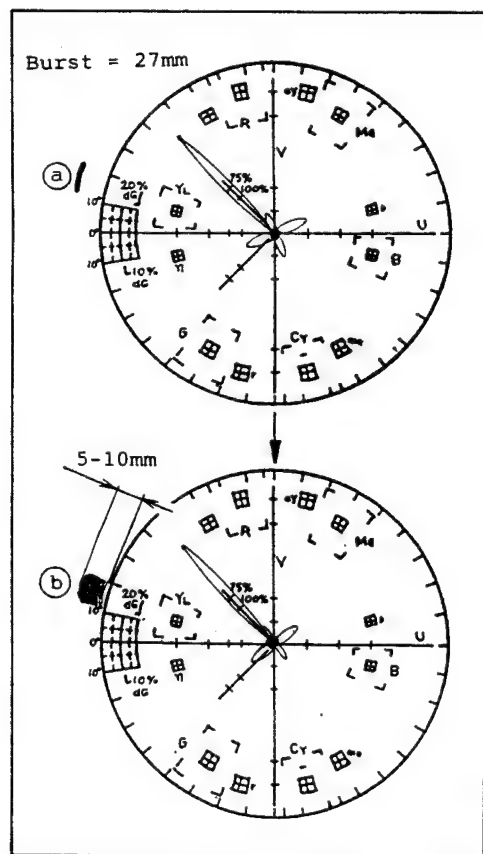


Fig. II-53

4-16 Blooming Adjustment

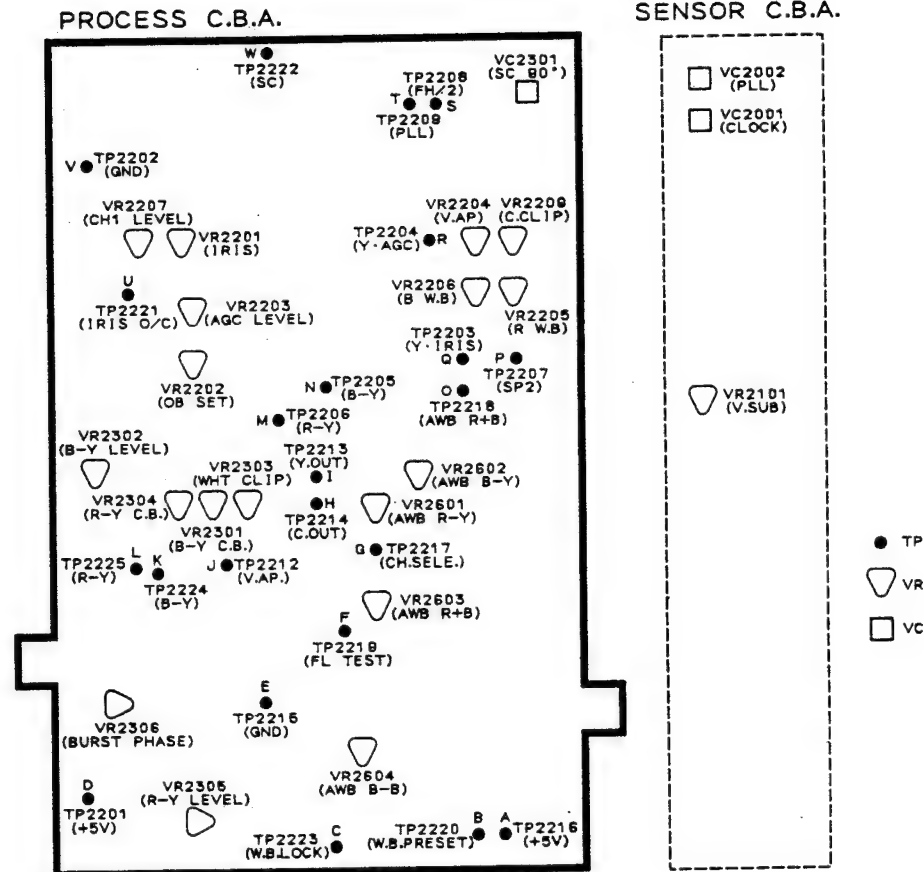
* Note: Perform this adjustment only when CCD/SENS C.B.A. replaced.

| | |
|--------|---|
| CHART | Halogen lamp (300W) |
| MODE | Iris opened PRO C.B.A. TP2221(IRIS 0/C)U ↔ TP2216(+5V)A |
| M. EQ. | Monitor TV |
| TOOL | ND filters (4, 8) |
| ADJ. | SENS C.B.A. VR2101(V.SUB) |

Procedures:

- 1) Set halogen lamp 1.2-1.5 m away from front lens.
- 2) Attach ND filters 4+8 onto the lens.
- 3) Set zoom ring to telephoto end.
Set focus ring to closest end.
- 4) Eliminate blooming on monitor TV.

4-17 Locations of TP/VR/VC



5. Adjustments (Recorder Section)

5-1 SS5V Adjustment

| MODE | REC |
|----------|---------------------------|
| M. EQ. | Digital voltmeter |
| TP/TRIG. | R-KEY1 C.B.A. CN004 Pin 6 |
| ADJ. | SS C.B.A. VR601 |
| SPEC. | $5.1 \pm 0.1V$ |

5-2 AV5V Adjustment

| MODE | STOP |
|----------|-------------------|
| M. EQ. | Digital voltmeter |
| TP/TRIG. | AV C.B.A. TP103 |
| ADJ. | AV C.B.A. VR108 |
| SPEC. | $5.1 \pm 0.1V$ |

5-3 Undercut Adjustment

| MODE | REC |
|--------|--------------------------------|
| M. EQ. | Digital voltmeter, Monitor TV. |
| ADJ. | SS C.B.A. VR602 |
| SPEC. | $80 \pm 0.1H/5.75 \pm 0.1V$ |

Procedures:

- 1) Set voltages at pins 1-2 (CN612) to $5.75 \pm 0.1V$.
- 2) Turn on SERVICE-2 switch of R-KEY2 C.B.A., (SERVICE Mode)
- 3) Turn VR until the spec. obtained.

5-4 ATF Bias Adjustment

| SIGNAL | Monoscope master (DY9-1062-000) |
|--------|---------------------------------|
| MODE | PB |
| M. EQ. | Monitor TV |
| ADJ. | SS C.B.A. VR401 |
| SPEC. | $80 \pm 0.3H$ |

Procedures:

- 1) Turn on SERVICE-2 switch of R-KEY2 C.B.A., (SERVICE mode)
- 2) Short TP401(16K) and TP402(47K) of SS C.B.A. by using a capacitor. (Use a capacitor approx. $10 \mu F/10V$.)
- 3) Turn VR until the spec. obtained.

5-5 Switching Point Adjustment

| SIGNAL | Monoscope master (DY9-1062-000) |
|----------|------------------------------------|
| MODE | PB |
| M. EQ. | Oscilloscope |
| TP/TRIG. | SS C.B.A. TP410 VIDEO C.B.A. TP108 |
| ADJ. | SS-1 C.B.A. VR603 |
| SPEC. | $7H \pm 1H$ |

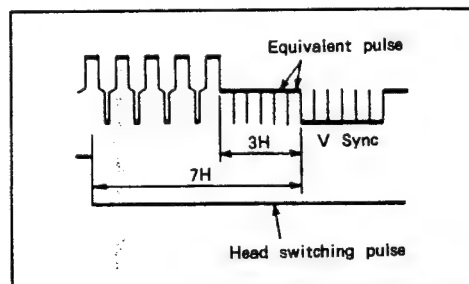


Fig. II-54

5-6 Y/C Separation Adjustment

| SIGNAL | Color bar |
|----------|---|
| MODE | EE |
| M. EQ. | Oscilloscope |
| TP/TRIG. | AV C.B.A. TP112 |
| ADJ. | AV C.B.A. VR112 |
| SPEC. | Minimize chrominance component as possible. |

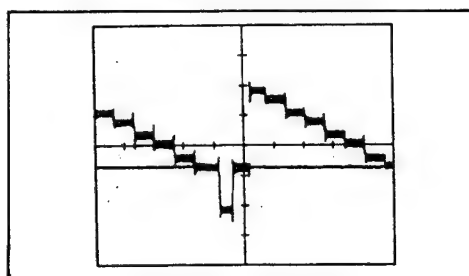


Fig. II-55 10 μs /20 mV

5-7 YFM Carrier Adjustment

| SIGNAL | Black (Cut R.G. and B with raster.) |
|----------|---------------------------------------|
| MODE | REC (SP) |
| M. EQ. | Oscilloscope |
| TP/TRIG. | AV C.B.A. TP106 |
| ADJ. | AV C.B.A. VR110 |
| SPEC. | 0.24 μs /cycle (4.2 MHz approx.) |

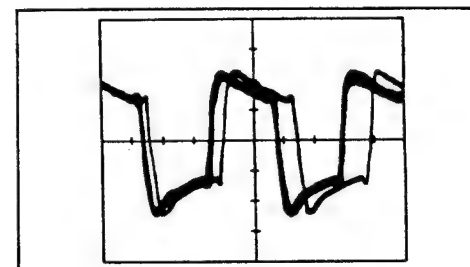


Fig. II-56 50 ns/10 mV

* Note: Use the signal waveform having longer cycle.

5-8 YFM Deviation Adjustment

| SIGNAL | 100% white video signal |
|----------|---------------------------------------|
| MODE | REC (SP) |
| M. EQ. | Oscilloscope |
| TP/TRIG. | AV C.B.A. TP106 |
| ADJ. | AV C.B.A. VR111 |
| SPEC. | 0.37 μs /cycle (5.4 MHz approx.) |

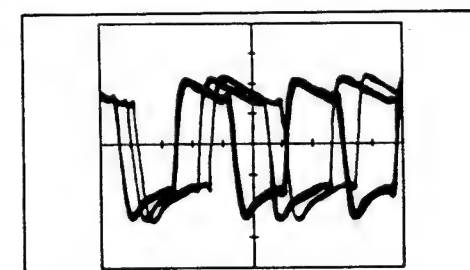


Fig. II-57 50 ns/10 mV

* Note: Use the signal waveform having the shortest cycle.

5-9 FM Audio Carrier Adjustment

| SIGNAL | No signal (Terminal-opened) |
|----------|-----------------------------|
| MODE | REC |
| M. EQ. | Oscilloscope |
| TP/TRIG. | AV C.B.A. TP113 |
| ADJ. | AV C.B.A. VR102 |
| SPEC. | $1.5 \pm 0.02 \text{ MHz}$ |

5-10 FM Audio Deviation Adjustment

| SIGNAL | D.O. Adj. Master (DY9-1064-000) |
|----------|---------------------------------|
| MODE | PB |
| M. EQ. | Oscilloscope |
| TP/TRIG. | PIN JACK C.B.A. CN003 Pin 2 |
| ADJ. | AV C.B.A. VR101 |
| SPEC. | $890 \pm 50 \text{ mV}$ |

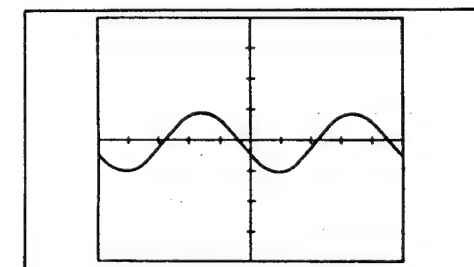


Fig. II-58 5 ms/50 mV

5-11 Recording Current Adjustment

(1) Luminance Signal

| SIGNAL | No signal (Terminal-opened) |
|----------|-----------------------------|
| MODE | REC |
| M. EQ. | Oscilloscope |
| TP/TRIG. | AV C.B.A. TP102 |
| ADJ. | AV C.B.A. VR106 |
| SPEC. | $330 \pm 10 \text{ mV}$ |

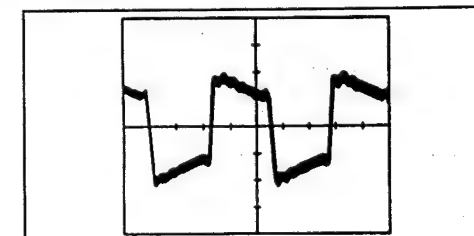
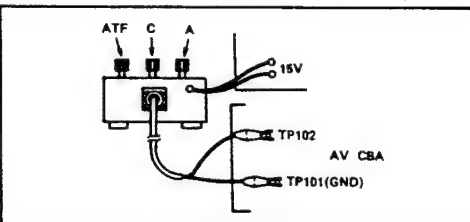


Fig. II-59 50 μs /10 mV

| | |
|----------|---|
| MODE | REC |
| M. EQ. | Oscilloscope |
| TP/TRIG. | AV C.B.A. TP102 |
| TOOL | Recording current checker (DY9-1056-000) |



Chrominance

| | |
|--------|-----------------|
| SIGNAL | Color bar |
| ADJ | AV C.B.A. VR105 |
| SPEC. | 2.6 Vp-p |

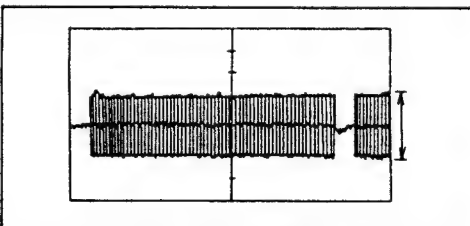


Fig. II-61 5 ms/50 mV

Audio

| | |
|--------|-----------------------------|
| SIGNAL | No signal (Terminal-opened) |
| ADJ. | AV C.B.A. VR103 |
| SPEC. | 1.85 Vp-p |

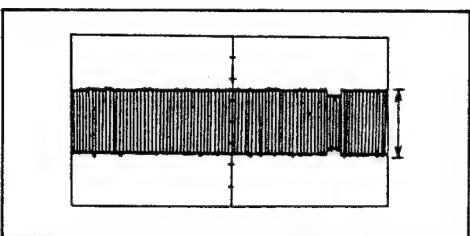


Fig. II-62 50 μ s/50 mV

| ATF | |
|--------|-----------------|
| SIGNAL | Color bar |
| ADJ. | AV C.B.A. VR104 |
| SPEC. | 1.4 Vp-p |

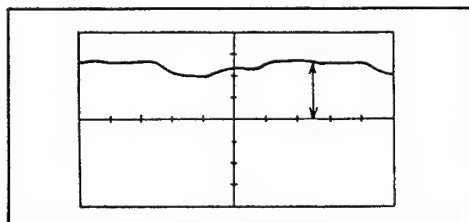


Fig. II-63 5 ms/50 mV DC

5-12 Playback Y Level Adjustment

| | |
|----------|-------------------------|
| SIGNAL | 100% white video signal |
| MODE | PLAYBACK |
| M. EQ. | Oscilloscope |
| TP/TRIG. | VIDEO C.B.A. TP108 |
| ADJ. | VIDEO C.B.A. VR109 |
| SPEC. | 0.48 + 0.02V |

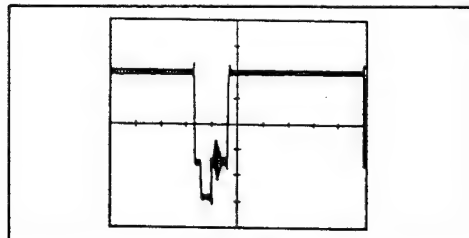


Fig. II-64

Procedures:

- 1) Record white 100% signal in SP mode.
 - 2) Playback the recorded part.
- Then, adjust it as specified.

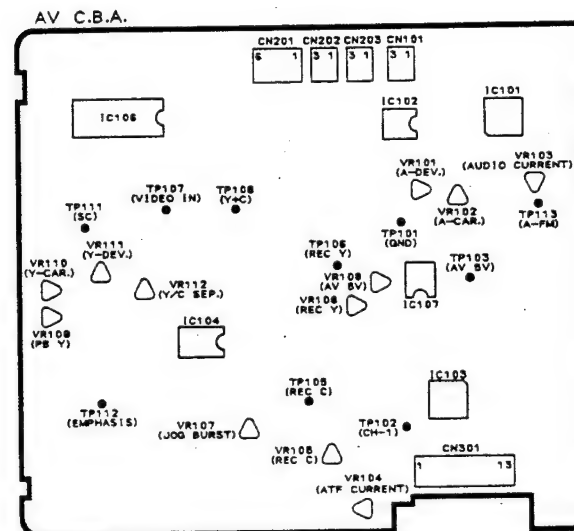
5-13 JOG Chrominance Phase Adjustment

| | |
|--------|--------------------------------|
| SIGNAL | Red signal (pattern generator) |
| MODE | Search |
| M. EQ | Monitor |
| ADJ. | VIDEO C.B.A. VR107 |
| SPEC. | Eliminate the block stripes |

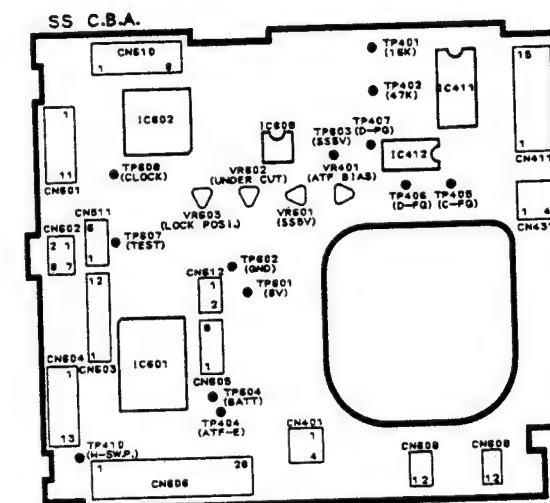
Procedures:

- 1) Record red signal in LP mode.
- 2) Playback and search the recorded part.
- 3) Eliminate the black stripes on the screen.

5-14 Locations of TP/VR VC



| | |
|--------------|-------------------|
| TP101 GND | VR101 A-DEV. |
| 102 CH-I | 102 A-CAR. |
| 103 AV5V | 103 AUDIO CURRENT |
| 105 REC C | 104 ATF CURRENT |
| 106 REC Y | 105 REC C |
| 107 VIDEO IN | 106 REC Y |
| 108 Y+C | 107 JOG BURST |
| 111 SC | 108 AV5V |
| 112 EMPHASIS | 109 PB Y |
| 113 A-FM | 110 Y-CAR. |
| | 111 Y-DEV. |
| | 112 Y/C SEP. |



| | |
|-------------|----------------|
| TP401 16K | VR401 ATF BIAS |
| 402 47K | 601 SS5V |
| 404 ATF-E | 602 UNDER CUT |
| 405 C-FG | 603 LOCK POSI. |
| 406 D-FG | |
| 407 D-PG | |
| 410 H-SW.P. | |
| 601 6V | |
| 602 GND | |
| 603 SS5V | |
| 604 BATT | |
| 607 TEST | |
| 608 CLOCK | |

6. Adjustment (EVF Section)

6-1 EVF 5V Adjustment

| | |
|----------|--------------------|
| M. EQ. | Digital voltmeter |
| TP/TRIG. | GRIP C.B.A. TP2933 |
| ADJ. | GRIP C.B.A. VR2931 |
| SPEC. | 5.1 ± 0.05V |

6-2 Free-Run Frequency Adjustment

| | |
|----------|---------------------------------|
| SIGNAL | No signal (Terminal-opened) |
| MODE | LINE IN |
| M. EQ. | Oscilloscope, Frequency counter |
| TP/TRIG. | GRIP C.B.A. TP2901 |
| ADJ. | GRIP C.B.A. VR2901 |
| SPEC. | 15.90 ± 0.05 KHz |

6-3 Vertical Amplitude Adjustment

| | |
|--------|---|
| SIGNAL | Monoscope master (DY9-1062-000) |
| MODE | PLAY |
| M. EQ. | EVF, Monitor TV |
| ADJ. | GRIP C.B.A. VR2902 |
| SPEC. | No distortion in the circle pattern on monoscope master. Comparing circle pattern image or monoscope master with that on monitor TV, make sure there is no noticeable difference between them. |

6-4 Rotation & Centering Adjustments

| | |
|--------|--|
| SIGNAL | Monoscope master (DY9-1062-000) |
| MODE | PLAY |
| M. EQ. | EVF |
| ADJ. | Deflection yoke, Centering magnet |
| SPEC. | No tilt on pattern image and centered correctly. |

- Procedures:
- 1) Loosen the clamp ring of deflection yoke so that the yoke can be turned.
 - 2) Turn the deflection yoke to correct for tilt of pattern image.
- * Note: Hold the deflection yoke to the stop position on CRT screen side.
- 3) Tighten the clamp ring.
- * Note: Clamp ring should be tightened to such an extent that the centering magnet can be moved.
- 4) Adjust the centering magnet for centering the pattern image.

- 5) Tighten the clamp ring securely.
- * Note: Take care not to overtighten.
- 6) Fix the centering magnet with a bit of lock paint or adhesive.
(At two points that are apart by 180° from each other.)

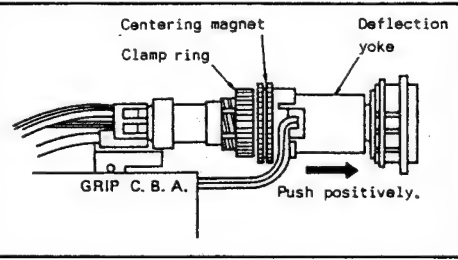


Fig. II-65

6-5 Character Position Adjustment (Character Generator)

| | |
|--------|--|
| SIGNAL | PAL signal |
| MODE | CAMERA E-E or VIDEO IN, REC PAUSE |
| ADJ. | VC2941 |
| SPEC. | Letter "E" positioned approx. 0.7-1.0mm apart from the right edge of CRT mask. |

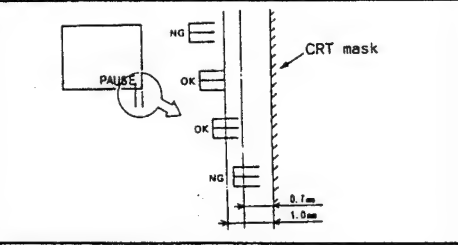


Fig. II-66

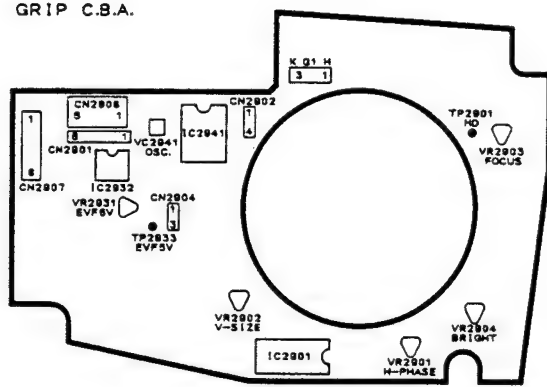
6-6 Brightness Adjustment

| | |
|--------|--|
| SIGNAL | Grayscale recorded on tape |
| MODE | PLAY |
| M. EQ. | EVF |
| ADJ. | VR2904 |
| SPEC. | Up to ten steps of grayscale should be identifiable. |

6-7 Focusing Adjustment

| | |
|--------|------------------------------------|
| MODE | REC PAUSE (Lens closed) |
| M. EQ. | EVF |
| ADJ. | VR2903 |
| SPEC. | REC PAUSE on EVF displayed clearly |

6-8 Locations of TP/VR VC




- TP2901 HD
2933 EVF 5V
- VR2901 H-PHASE
2902 V-SIZE
2903 FOCUS
2904 BRIGHT
2931 EVF 5V
VC2941 OSC.

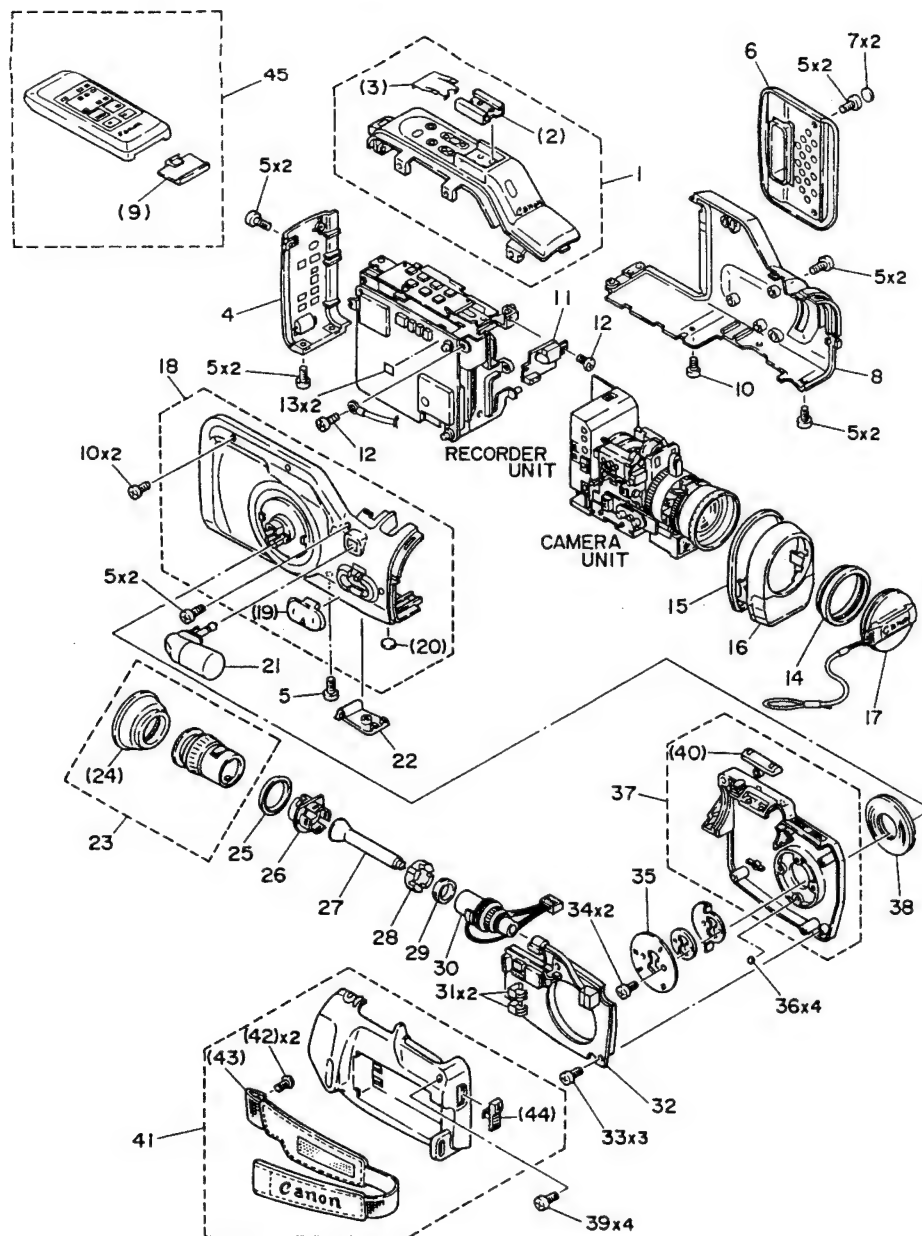
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| Mechanical Chassis Section 1 | III - 7 |
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| ELECTRICAL PARTS LIST | III - 13 |
| PARTS LIST | III - 20 |

1. ESPECIALLY CRITICAL PARTS IN THE POWER CIRCUIT BLOCK SHOULD NOT BE REPLACED WITH OTHER MARKS.
CRITICAL PARTS ARE MARKED WITH  IN THIS ELECTRICAL PARTS LIST.
2. THE NUMBERS INDICATED ON THE CONNECTORS DO NOT CORRESPOND TO THE SYMBOL NUMBERS.
PLEASE CHECK THE CORRECT SYMBOL NUMBERS OF THE CONNECTORS ON THE INTERCONNECTION SCHEMATIC DIAGRAM.

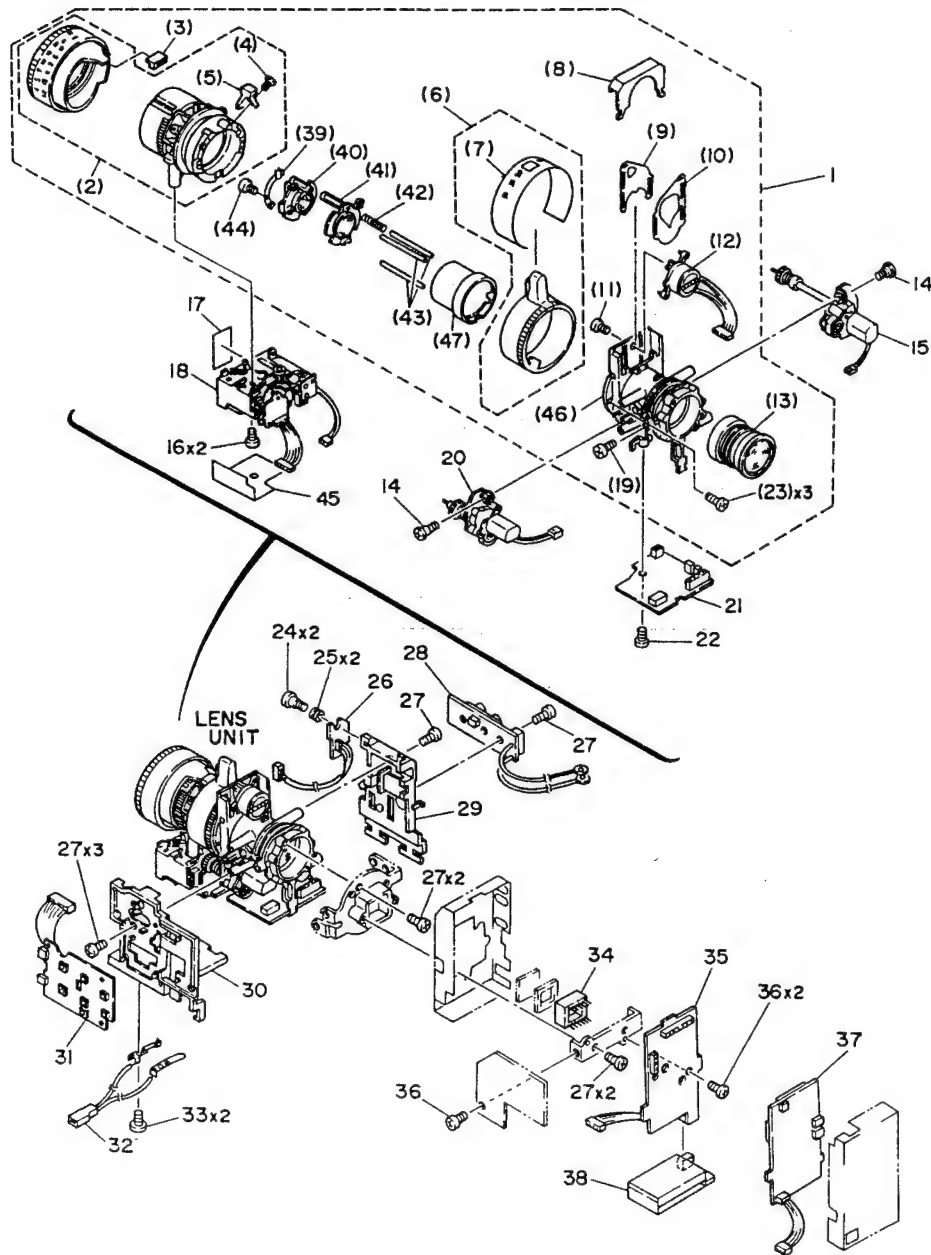
Casing Parts Section



MECHANICAL PARTS

| SYMBOL | PART NO. | CLASS | QTY | DESCRIPTION | REMARKS |
|--------|------------------|-------|-----|---------------------------|-----------|
| 1 | DY2-1087-000 000 | B | 1 | TOP COVER ASS'Y | E80E ONLY |
| | DY2-1088-000 000 | B | 1 | TOP COVER ASS'Y | E80F ONLY |
| 2 | DA1-1557-000 000 | B | 1 | ACCESSORY, SHOE | |
| 3 | DA1-1598-000 000 | B | 1 | SPRING, ACCESSORY SHOE | |
| 4 | DY2-1091-000 000 | B | 1 | REAR COVER ASS'Y | E80E ONLY |
| | DY2-1092-000 000 | B | 1 | REAR COVER ASS'Y | E80F ONLY |
| 5 | XAL-7200-459 000 | F | 13 | SCREW, CROSS-RECESS, PH | |
| 6 | DF1-0431-000 000 | C | 1 | COVER, CASSETTE | E80E ONLY |
| | DF1-0432-000 000 | C | 1 | COVER, CASSETTE | E80F ONLY |
| 7 | DA1-1840-000 000 | A | 2 | SEAL | |
| 8 | DY2-1089-000 000 | B | 1 | RIGHT COVER ASS'Y | E80E ONLY |
| | DY2-1090-000 000 | B | 1 | RIGHT COVER ASS'Y | E80F ONLY |
| 9 | Y22-2311-000 000 | B | 1 | COVER WIRELESS CONTROLLER | |
| 10 | XAL-7200-359 000 | F | 3 | SCREW, CROSS-RECESS, PH | |
| 11 | DG1-0485-000 000 | C | 1 | REMOCON C.B.A. | |
| 12 | XAL-7200-357 000 | F | 2 | SCREW, CROSS-RECESS, PH | |
| 13 | DA1-2147-000 000 | C | 2 | CUSHION | |
| 14 | DA1-1702-000 000 | B | 1 | HOOD | |
| 15 | DA1-1835-000 000 | C | 1 | RING, RUBBER | |
| 16 | DY2-1068-000 000 | B | 1 | FILTER, INFRARED | |
| 17 | DF1-0406-060 000 | B | 1 | CAP, LENS | |
| 18 | DY2-1101-000 000 | B | 1 | LEFT COVER ASS'Y | |
| 19 | DA1-1848-000 000 | B | 1 | COVER, RF | |
| 20 | DA1-1940-000 000 | C | 1 | SEAL, PC | |
| 21 | DH9-0389-000 000 | C | 1 | MICROPHONE | |
| 22 | DA1-1834-000 000 | B | 1 | COVER, BATTERY | |
| 23 | DG1-0498-000 000 | B | 1 | FINDER ASS'Y | |
| 24 | DA1-1573-000 000 | B | 1 | EYE CAP RUBBER | |
| 25 | DA1-1864-000 000 | B | 1 | RING, RUBBER | |
| 26 | DA1-1854-000 000 | C | 1 | MASK, CRT | |
| 27 | DH9-0323-000 000 | D | 1 | CRT | |
| 28 | DA1-1855-000 000 | C | 1 | RUBBER, MASK | |
| 29 | DA1-1856-000 000 | C | 1 | HOLDER, MASK | |
| 30 | DH9-0393-000 000 | C | 1 | DEFLECTION YOKE | |
| 31 | DA1-1853-000 000 | C | 2 | TERMINAL, BATTERY | |
| 32 | DG1-0550-000 000 | C | 1 | GRIP C.B.A. | |
| 33 | XAL-7200-459 000 | F | 3 | SCREW, CROSS-RECESS, PH | |
| 34 | XB1-1300-809 000 | F | 2 | SCREW | |
| 35 | DA1-1862-000 000 | C | 1 | PLATE | |
| 36 | DA1-1931-000 000 | C | 4 | STEEL BALL, SUJ (2) | |
| 37 | DY1-1065-000 000 | B | 1 | RIGHT COVER, GRIP | E80E ONLY |
| | DY1-1066-000 000 | B | 1 | RIGHT COVER, GRIP | E80F ONLY |
| 38 | DF1-0449-000 000 | C | 1 | PLATE, GRIP | |
| 39 | XAL-7260-709 000 | F | 4 | SCREW, CROSS-RECESS, PH | |
| 40 | DA1-1860-000 000 | C | 1 | TELE WIDE KNOB | |
| 41 | DY2-1071-000 000 | B | 1 | LEFT COVER, GRIP | |
| 42 | XAL-0435-010 000 | F | 2 | SCREW, CROSS-RECESS, PH | |
| 43 | DA1-1866-000 000 | B | 1 | STRAP, HAND | |
| 44 | DA1-1857-000 000 | C | 1 | KNOB, BATTERY | |
| 45 | DY2-6014-000 000 | C | 1 | WIRELESS CONTROLLER | E80E ONLY |
| | DY2-6016-000 000 | C | 1 | WIRELESS CONTROLLER | E80F ONLY |

Lens/Camera Unit Section

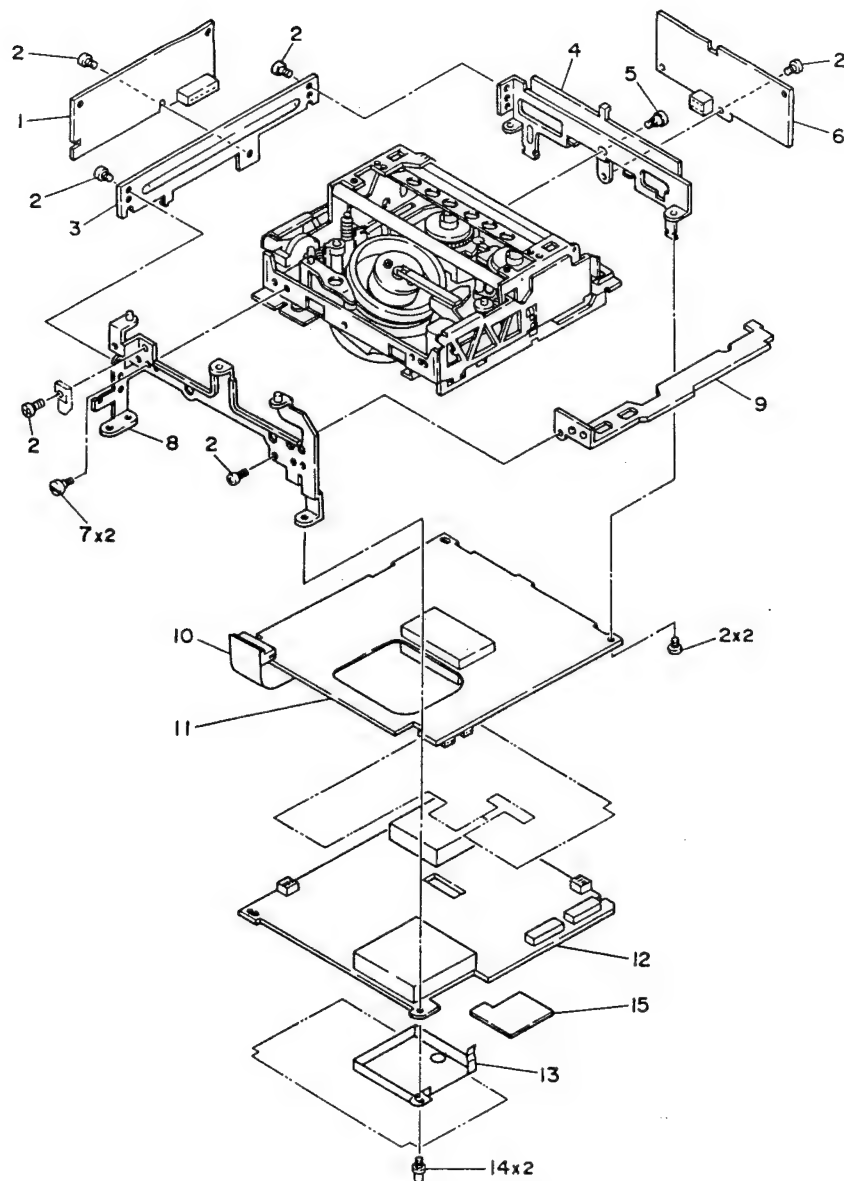


MECHANICAL PARTS

| SYMBOL | PART NO. | CLASS | QTY | DESCRIPTION | REMARKS |
|--------|------------------|-------|-----|-------------------------------|---------|
| 1 | DY1-7098-000 000 | C | 1 | ZOOM LENS ASS'Y | |
| 2 | DY1-7100-000 000 | C | 1 | FOCUS LENS ASS'Y | |
| 3 | DA7-1734-000 000 | C | 1 | STOPPER, RUBBER | |
| 4 | XA4-4200-507 000 | F | 1 | SCREW, CROSS-RECESS, PH | |
| 5 | DA7-1724-000 000 | C | 1 | STOPPER, NEARDISTANCE | |
| 6 | DG9-3382-000 000 | C | 1 | ZOOM RING ASS'Y | |
| 7 | DA7-1728-000 000 | C | 1 | SHEET, ZOOM | |
| 8 | DA7-1739-000 000 | C | 1 | COVER, IG METER | |
| 9 | DF7-0227-000 000 | C | 1 | BLIND, IG METER (B) | |
| 10 | DA7-1730-000 000 | C | 1 | BLIND, IG METER (A) | |
| 11 | XA4-4170-407 000 | F | 1 | SCREW, CROSS-RECESS, PH | |
| 12 | DH8-0043-000 000 | C | 1 | IG METER | |
| 13 | DG9-3306-000 000 | C | 1 | RELAY LENS ASS'Y | |
| 14 | X96-1723-610 000 | F | 2 | SCREW, SLOTTED, SHOULDER | |
| 15 | DG9-3310-000 000 | C | 1 | AF MOTOR ASS'Y D.C. 10W UNDER | |
| 16 | XA4-2170-707 000 | F | 2 | SCREW, CROSS-RECESS, PH | |
| 17 | DA7-1738-000 000 | C | 1 | SHIELD, LIGHT | |
| 18 | DY1-7097-000 000 | C | 1 | AF BLOCK ASS'Y | |
| 19 | XB4-6260-607 000 | F | 1 | SCREW M2.6x6 | |
| 20 | DG9-3311-000 000 | C | 1 | PZ MOTOR ASS'Y D.C. 10W UNDER | |
| 21 | DG9-3372-000 000 | C | 1 | AF MAIN C.B.A. | |
| 22 | XA4-4170-507 000 | F | 1 | SCREW, CROSS-RECESS, PH | |
| 23 | XA4-9170-557 000 | F | 3 | SCREW, CROSS-RECESS, PH | |
| 24 | DA1-1815-000 000 | C | 2 | SCREW | |
| 25 | DA1-1811-000 000 | C | 2 | CUSHION, RUBBER | |
| 26 | DG1-0499-000 000 | C | 1 | MIC. JACK C.B.A. | |
| 27 | XA4-9200-609 000 | F | 9 | SCREW, CROSS-RECESS, PH | |
| 28 | DG1-0486-000 000 | C | 1 | PIN. JACK C.B.A. | |
| 29 | DA1-1802-000 000 | C | 1 | HOLDER, CAMERA 2 | |
| 30 | DF1-0448-000 000 | C | 1 | HOLDER, CAMERA 1 | |
| 31 | DG1-0484-010 000 | C | 1 | CAMERA KEY C.B.A. | |
| 32 | DF1-0436-010 000 | C | 1 | CONTACT, BATTERY | |
| 33 | XA4-9200-209 000 | F | 2 | SCREW | |
| 34 | DH4-0206-000 000 | B | 1 | CCD MN3745FC | |
| 35 | DG1-0533-000 000 | C | 1 | SENSOR C.B.A. | |
| 36 | XA1-7200-357 000 | F | 3 | SCREW, CROSS-RECESS, PH | |
| 37 | DG1-0534-000 000 | C | 1 | PROCESS C.B.A. | |
| 38 | DH3-0011-000 000 | C | 1 | DC/DC CONVERTER | |
| 39 | DA7-1727-000 000 | C | 1 | SPRING, PLATE | |
| 40 | DG9-3340-000 000 | C | 1 | VARIATOR LENS ASS'Y | |
| 41 | DG9-3341-000 000 | C | 1 | COMPENSATOR LENS ASS'Y | |
| 42 | DS1-5178-000 000 | C | 1 | SPRING, COIL | |
| 43 | DA7-1620-000 000 | C | 1 | BAR, ZOOMING | |
| 44 | XA4-4170-409 000 | F | 1 | SCREW, CROSS-RECESS, PH | |
| 45 | DA1-2138-000 000 | C | 1 | SHEET | |
| 46 | DG9-3342-000 000 | C | 1 | RELAY HOLDER ASS'Y | |
| 47 | DA7-1717-000 000 | C | 1 | ZOOM CAM | |

* Be sure to attach SHIELD, LIGHT (No.17) after replacing AF BLOCK ASS'Y (No.18).

Recorder Unit Section

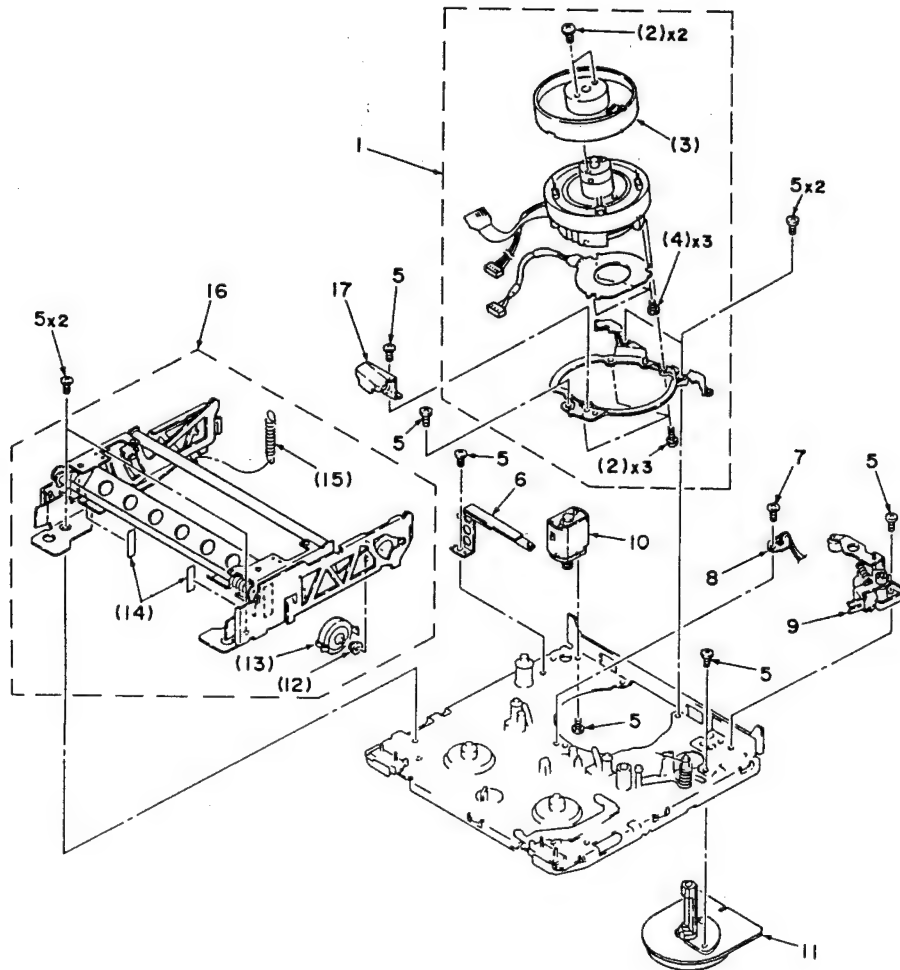


MECHANICAL PARTS

| SYMBOL | PART NO. | CLASS | QTY | DESCRIPTION | REMARKS |
|--------|------------------|-------|-----|-------------------------------|---------|
| 1 | DG1-0477-000 000 | C | 1 | RECORDER KEY (1) C.B.A. | |
| 2 | XAL-7200-357 000 | F | 8 | SCREW, CROSS-RECESS, PH | |
| 3 | DAL-1822-000 000 | C | 1 | HOLDER, RECORDER (3) | |
| 4 | DF1-0443-000 000 | C | 1 | HOLDER, RECORDER (2) | |
| 5 | DAL-1900-000 000 | C | 1 | SCREW | |
| 6 | DG1-0478-000 000 | C | 1 | RECORDER KEY (2) C.B.A. | * |
| 7 | DAL-1948-000 000 | C | 2 | SCREW | |
| 8 | DF1-0442-000 000 | C | 1 | HOLDER, RECORDER (1) | |
| 9 | DAL-1945-000 000 | C | 1 | HOLDER, RECORDER (4) | |
| 10 | DF1-0444-000 000 | C | 1 | PRINTED CORD P.I. W/CONNECTOR | |
| 11 | DG1-0529-000 000 | C | 1 | SYSCON SERVO C.B.A. | |
| 12 | DG1-0530-000 000 | C | 1 | AUDIO VIDEO C.B.A. | |
| 13 | DAL-1884-000 000 | C | 1 | CASE, SHIELD | |
| 14 | DAL-1895-000 000 | F | 2 | SCREW | |
| 15 | DG1-0525-001 000 | C | 1 | CT C.B.A. | |

* When the RECORDER KEY (2) C.B.A (No.6) is replaced, switch SW002 over to the language according to your necessity.

Mechanical Chassis Section I

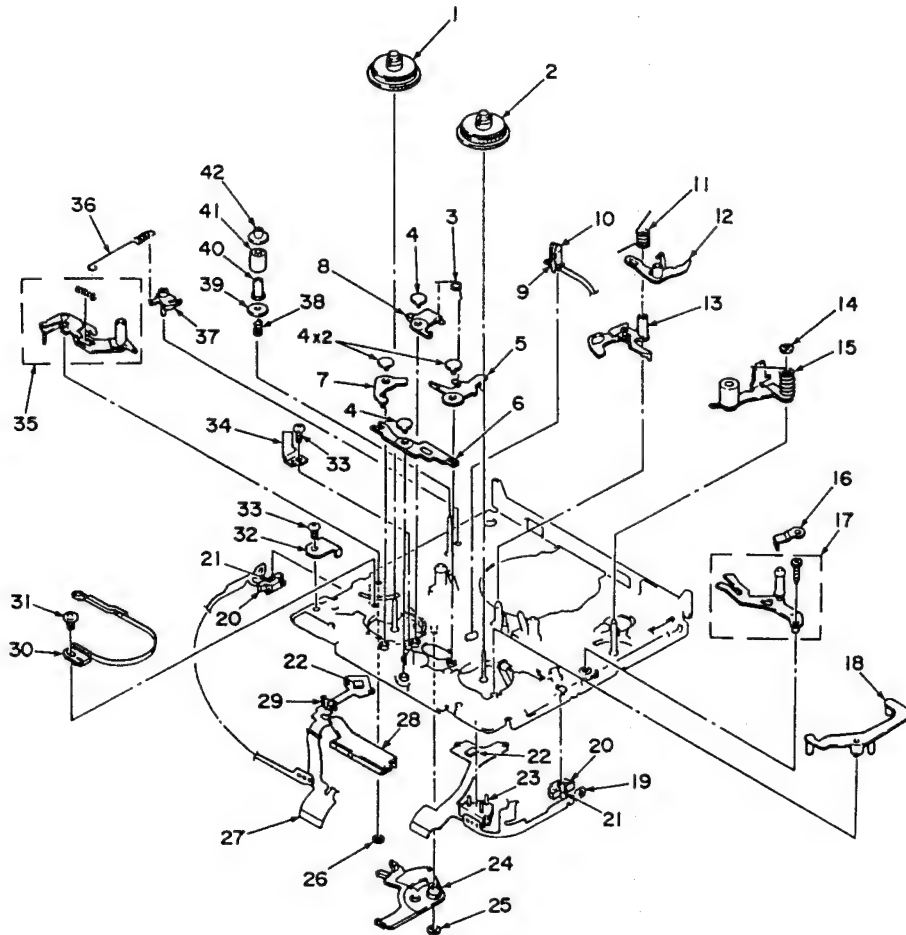


MECHANICAL PARTS

| SYMBOL | PART NO. | CLASS | QTY | DESCRIPTION | REMARKS |
|--------|------------------|-------|-----|----------------------------|---------|
| 1 | DY4-2732-000 000 | E | 1 | DRUM ASS'Y | |
| 2 | DY4-2730-000 000 | F | 5 | SCREW | |
| 3 | DY4-2733-000 000 | E | 1 | UPPER DRUM ASS'Y | |
| 4 | DY4-2452-000 000 | F | 3 | SCREW | |
| 5 | DY4-2727-000 000 | F | 10 | SCREW | |
| 6 | DY4-2675-000 000 | C | 1 | TERMINAL, EARTH | |
| 7 | DY4-2728-000 000 | F | 1 | SCREW | |
| 8 | Y22-8120-000 000 | B | 1 | SENSOR, DEW | |
| 9 | DY4-2652-000 000 | C | 1 | ROLLER ASS'Y | |
| 10 | DY4-2651-000 000 | C | 1 | LOADING MOTOR ASS'Y | |
| 11 | DY4-2726-000 000 | C | 1 | CAPSTAN MOTOR | |
| 12 | DY4-2720-000 000 | C | 1 | DAMPER, OIL | |
| 13 | DY4-2709-000 000 | C | 1 | GEAR, DAMPER | |
| 14 | DY4-2729-000 000 | C | 2 | TAPE | |
| 15 | DY4-2708-000 000 | C | 1 | SPRING, COIL | |
| 16 | DY4-2673-000 000 | C | 1 | CASSETTE COMPARTMENT ASS'Y | |
| 17 | DY4-2721-000 000 | C | 1 | GUARD, GUIDE | |

Mechanical Chassis Section 2

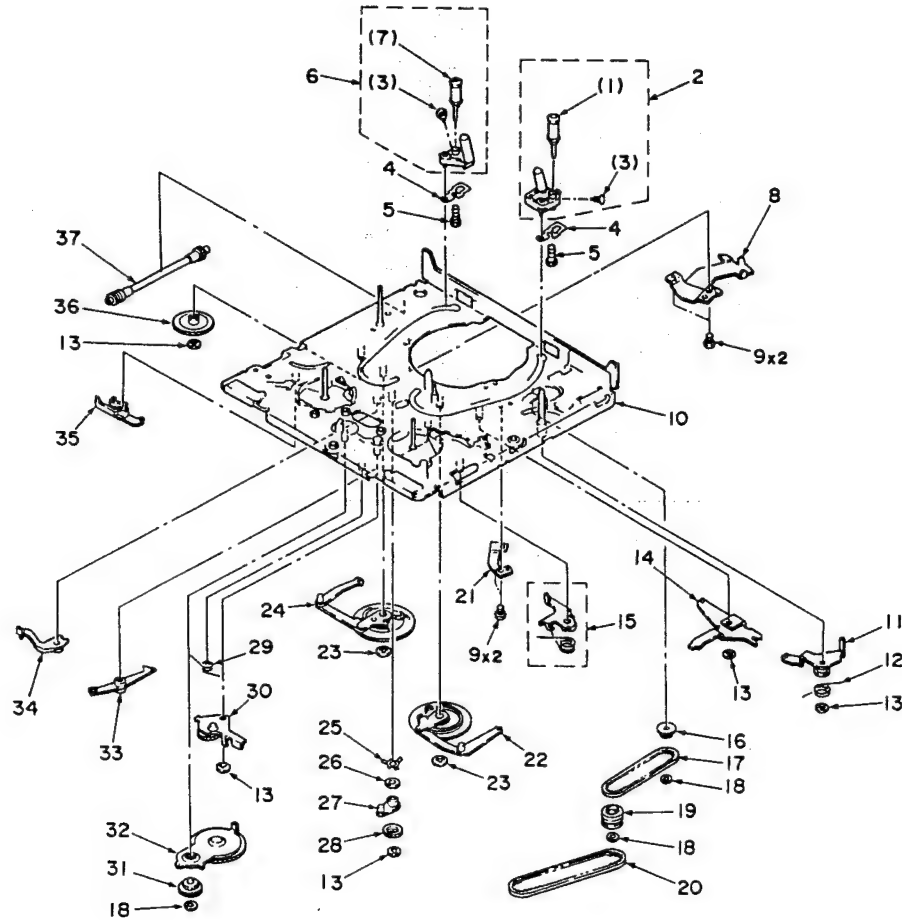
MECHANICAL PARTS



| SYMBOL | PART NO. | CLASS | QTY | DESCRIPTION | REMARKS |
|--------|------------------|-------|-----|--------------------------|---------|
| 1 | DY4-2663-000 000 | C | 1 | REEL, SUPPLY | |
| 2 | DY4-2666-000 000 | C | 1 | REEL, TAKE UP | |
| 3 | DY4-2699-000 000 | C | 1 | SPRING, COIL | |
| 4 | DY4-2696-000 000 | C | 1 | PIN, SHAFT | |
| 5 | DY4-2714-000 000 | C | 1 | BRAKE, T | |
| 6 | DY4-2692-000 000 | C | 1 | LEVER, LB | |
| 7 | DY4-2691-000 000 | C | 1 | BRAKE, LB | |
| 8 | DY4-2713-000 000 | C | 1 | BRAKE, S | |
| 9 | DY4-2710-000 000 | C | 1 | HOLDER, LED | |
| 10 | Y22-8012-000 000 | B | 1 | LED GL452S | |
| 11 | DY4-2697-000 000 | C | 1 | SPRING, COIL | |
| 12 | DY4-2716-000 000 | C | 1 | ARM, STOPPER | |
| 13 | DY4-2723-000 000 | C | 1 | STOPPER, RK | |
| 14 | DY4-2440-000 000 | F | 1 | WASHER | |
| 15 | DY4-2653-000 000 | C | 1 | ARM, FINCH | |
| 16 | DY4-2707-000 000 | C | 1 | SPRING, PLATE | |
| 17 | DY4-2664-000 000 | C | 1 | ARM, TG7 | |
| 18 | DY4-2712-000 000 | C | 1 | ARM RELEASE | |
| 19 | DY4-2680-000 000 | C | 1 | FLEXIBLE C.B.A. (2) | |
| 20 | DY4-2722-000 000 | C | 2 | HOLDER, SENSOR | |
| 21 | Y22-8123-000 000 | B | 2 | PHOTO TRANSISTOR EE-P109 | |
| 22 | Y22-8121-000 000 | B | 2 | SENSOR, PHOTO TLP907-0 | |
| 23 | DY4-2678-000 000 | C | 1 | SWITCH, PUSH | |
| 24 | DY4-2657-000 000 | C | 1 | LEVER, SWITCH | |
| 25 | DY4-2688-000 000 | F | 1 | WASHER | |
| 26 | DY4-2681-000 000 | F | 1 | WASHER | |
| 27 | DY4-2679-000 000 | C | 1 | FLEXIBLE C.B.A. (1) | |
| 28 | DY4-2677-000 000 | C | 1 | SWITCH, SLIDE | |
| 29 | DY4-2676-000 000 | C | 1 | SWITCH | |
| 30 | DY4-2660-000 000 | C | 1 | BAND, TENSION | |
| 31 | DY4-2727-000 000 | F | 1 | SCREW | |
| 32 | DY4-2725-000 000 | C | 1 | PLATE, SWITCH | |
| 33 | DY4-2728-000 000 | F | 2 | SCREW | |
| 34 | DY4-2690-000 000 | C | 1 | PLATE, TL | |
| 35 | DY4-2669-000 000 | C | 1 | ARM | |
| 36 | DY4-2724-000 000 | C | 1 | SPRING, COIL | |
| 37 | DY4-2717-000 000 | C | 1 | ARM, ADJUST | |
| 38 | DY4-2705-000 000 | C | 1 | SPRING, COIL | |
| 39 | DY4-2701-000 000 | C | 1 | FRANGE, TG2 | |
| 40 | DY4-2704-000 000 | C | 1 | SLEEVE, TG2 | |
| 41 | DY4-2702-000 000 | C | 1 | ROLLER, TG2 | |
| 42 | DY4-2703-000 000 | C | 1 | FRANGE, TG2 | |

Mechanical Chassis Section 3

MECHANICAL PARTS



| SYMBOL | PART NO. | CLASS | QTY | DESCRIPTION | REMARKS |
|--------|------------------|-------|-----|------------------|---------|
| 1 | DY4-2674-000 000 | C | 1 | ROLLER, GUIDE | |
| 2 | DY4-2649-000 000 | C | 1 | COASTER, RIGHT | |
| 3 | DY4-2686-000 000 | F | 2 | SCREW | |
| 4 | DY4-2685-000 000 | C | 2 | SPRING, LEAF | |
| 5 | DY4-2689-000 000 | F | 2 | SCREW | |
| 6 | DY4-2648-000 000 | C | 1 | COASTER, LEFT | |
| 7 | DY4-2662-000 000 | C | 1 | ROLLER | |
| 8 | DY4-2672-000 000 | C | 1 | PLATE, SS | |
| 9 | DY4-2728-000 000 | F | 4 | SCREW | |
| 10 | DY4-2670-000 000 | C | 1 | CHASSIS ASS'Y | |
| 11 | DY4-2665-000 000 | C | 1 | ARM, PINCH SUB | |
| 12 | DY4-2706-000 000 | C | 1 | SPRING, COIL | |
| 13 | DY4-2688-000 000 | F | 5 | WASHER | |
| 14 | DY4-2655-000 000 | C | 1 | LEVER, THREADING | |
| 15 | DY4-2659-000 000 | C | 1 | BRAKE, TS | |
| 16 | DY4-2656-000 000 | C | 1 | GEAR, JOINT | |
| 17 | DY4-2719-000 000 | E | 1 | BELT (S), TIMING | |
| 18 | DY4-2681-000 000 | F | 3 | WASHER | |
| 19 | DY4-2671-000 000 | C | 1 | PULLY, RELAY | |
| 20 | DY4-2718-000 000 | E | 1 | BELT (L), TIMING | |
| 21 | DY4-2684-000 000 | C | 1 | PLATE, TT | |
| 22 | DY4-2668-000 000 | C | 1 | GEAR | |
| 23 | DY4-2440-000 000 | F | 2 | WASHER | |
| 24 | DY4-2667-000 000 | C | 1 | GEAR | |
| 25 | DY4-2700-000 000 | C | 1 | SPRING | |
| 26 | DY4-2527-000 000 | F | 1 | WASHER | |
| 27 | DY4-2695-000 000 | C | 1 | ARM, UL | |
| 28 | DY4-2694-000 000 | C | 1 | GEAR, UL | |
| 29 | DY4-2698-000 000 | C | 1 | SPRING, COIL | |
| 30 | DY4-2650-000 000 | C | 1 | GEAR, ASS'Y | |
| 31 | DY4-2661-000 000 | C | 1 | GEAR | |
| 32 | DY4-2654-000 000 | C | 1 | GEAR, ASS'Y | |
| 33 | DY4-2693-000 000 | C | 1 | ARM, RELEASE | |
| 34 | DY4-2715-000 000 | C | 1 | BRAKE, UL | |
| 35 | DY4-2711-000 000 | C | 1 | LEVER, EJECT | |
| 36 | DY4-2687-000 000 | C | 1 | GEAR, WHEEL | |
| 37 | DY4-2658-000 000 | C | 1 | WORM ASS'Y | |

ELECTRICAL PARTS

| SYMBOL | PART NO. | CLASS | QTY | DESCRIPTION | REMARKS |
|-------------------------|------------------|-------|-----|-------------------------------|---------|
| C113 | VC5-5030-474 000 | C | 1 | CAPACITOR, TANTA. 0.47μF 20V | |
| C121 | VC5-0070-225 000 | C | 1 | CAPACITOR, TANTA. 2.2μF 6.3V | |
| C131 | VC5-0070-225 000 | C | 1 | CAPACITOR, TANTA. 2.2μF 6.3V | |
| C139 | VC5-0700-105 000 | C | 1 | CAPACITOR, TANTA. 1μF 10V | |
| C149 | VC5-9860-334 000 | C | 1 | CAPACITOR, TANTA. 0.33μF 25V | |
| C150 | VC5-0700-225 000 | C | 1 | CAPACITOR, TANTA. 2.2μF 10V | |
| C162 | VC6-4310-336 000 | C | 1 | CAPACITOR, TANTA. 33μF 10V | |
| C175 | VC5-0090-473 000 | C | 1 | CAPACITOR, TANTA. 0.047μF 35V | |
| C200 | VC5-0700-226 000 | C | 1 | CAPACITOR, TANTA. 22μF 10V | |
| C238 | VC5-0700-105 000 | C | 1 | CAPACITOR, TANTA. 1μF 10V | |
| C240 | VC5-0700-106 000 | C | 1 | CAPACITOR, TANTA. 10μF 10V | |
| C248 | VC5-5030-474 000 | C | 1 | CAPACITOR, TANTA. 0.47μF 20V | |
| C250 | VC5-0700-105 000 | C | 1 | CAPACITOR, TANTA. 1μF 10V | |
| C287 | VC5-5030-474 000 | C | 1 | CAPACITOR, TANTA. 0.47μF 20V | |
| C290 | VC5-0700-105 000 | C | 1 | CAPACITOR, TANTA. 1μF 10V | |
| C291 | VC5-0700-105 000 | C | 1 | CAPACITOR, TANTA. 1μF 10V | |
| C292 | VC5-0700-105 000 | C | 1 | CAPACITOR, TANTA. 1μF 10V | |
| C293 | VC5-0700-105 000 | C | 1 | CAPACITOR, TANTA. 1μF 10V | |
| C296 | VC5-0070-335 000 | C | 1 | CAPACITOR, TANTA. 3.3μF 6.3V | |
| C298 | VC5-0700-105 000 | C | 1 | CAPACITOR, TANTA. 1μF 10V | |
| C299 | VC5-0700-105 000 | C | 1 | CAPACITOR, TANTA. 1μF 10V | |
| C305 | VC5-0700-105 000 | C | 1 | CAPACITOR, TANTA. 1μF 10V | |
| C309 | VC5-0090-104 000 | C | 1 | CAPACITOR, TANTA. 0.1μF 35V | |
| C310 | VC5-0070-335 000 | C | 1 | CAPACITOR, TANTA. 3.3μF 6.3V | |
| C311 | VC5-0700-105 000 | C | 1 | CAPACITOR, TANTA. 1μF 10V | |
| C605 | VC6-4300-226 000 | C | 1 | CAPACITOR, TANTA. 22μF 16V | |
| C607 | VC6-4300-226 000 | C | 1 | CAPACITOR, TANTA. 22μF 16V | |
| C608 | VC5-5030-474 000 | C | 1 | CAPACITOR, TANTA. 0.47μF 20V | |
| C614 | VC6-4300-226 000 | C | 1 | CAPACITOR, TANTA. 22μF 16V | |
| C617 | VC6-4310-336 000 | C | 1 | CAPACITOR, TANTA. 33μF 10V | |
| C623 | VC5-5030-474 000 | C | 1 | CAPACITOR, TANTA. 0.47μF 20V | |
| C2008 | VC5-5050-106 000 | C | 1 | CAPACITOR, TANTA. 10μF 10V | |
| C2014 | VC5-5050-106 000 | C | 1 | CAPACITOR, TANTA. 10μF 16V | |
| C2021 | VC5-0070-225 000 | C | 1 | CAPACITOR, TANTA. 2.2μF 6.3V | |
| C2066 | VC5-5050-106 000 | C | 1 | CAPACITOR, TANTA. 10μF 16V | |
| C2109 | VC5-5050-226 000 | C | 1 | CAPACITOR, TANTA. 22μF 16V | |
| C2110 | VC5-5050-106 000 | C | 1 | CAPACITOR, TANTA. 10μF 16V | |
| C2232 | VC5-5050-106 000 | C | 1 | CAPACITOR, TANTA. 10μF 16V | |
| C2304 | VC5-0070-226 000 | C | 1 | CAPACITOR, TANTA. 22μF 6.3V | |
| C2307 | VC5-5050-106 000 | C | 1 | CAPACITOR, TANTA. 10μF 16V | |
| C2615 | VC5-0070-225 000 | C | 1 | CAPACITOR, TANTA. 2.2μF 6.3V | |
| C2625 | VC5-0070-225 000 | C | 1 | CAPACITOR, TANTA. 2.2μF 6.3V | |
| C2701 | VC5-5050-106 000 | C | 1 | CAPACITOR, TANTA. 10μF 16V | |
| C2705 | VC5-5050-475 000 | C | 1 | CAPACITOR, TANTA. 4.7μF 16V | |
| C2903 | VC5-8150-684 202 | C | 1 | CAPACITOR, TANTA. 0.68μF 20V | |
| C2904 | VC9-9046-000 000 | C | 1 | CAPACITOR, TANTA. 0.68μF 20V | |
| C2910 | VC5-8160-224 000 | C | 1 | CAPACITOR, TANTA. 0.22μF 35V | |
| C2915 | VC5-9850-472 000 | C | 1 | CAPACITOR, FILM 4700pF 100V | |
| C2917 | VC5-9520-102 000 | C | 1 | CAPACITOR, CERA. 1000pF 1KV | |
| C2918 | VC6-1570-152 000 | C | 1 | CAPACITOR, CERA. 1500pF 500V | |
| C2934 | VC5-5050-106 000 | C | 1 | CAPACITOR, TANTA. 10μF 16V | |
| C2944 | VC5-0700-225 000 | C | 1 | CAPACITOR, TANTA. 2.2μF 10V | |
| C2954 | VC5-5050-106 000 | C | 1 | CAPACITOR, TANTA. 10μF 16V | |
| CN002, (LITH IUM)/CN611 | DH2-0944-040 000 | C | 1 | CONNECTOR ASS'Y 6P | |
| CN003/CN201 | DF1-0446-000 000 | C | 1 | CONNECTOR ASS'Y 6P | |
| CN202/CN2904 | DH2-0951-000 000 | C | 1 | CONNECTOR ASS'Y 3P | |
| CN203/CN2205 | DH2-0952-000 000 | C | 1 | CONNECTOR ASS'Y 3P | |
| CN302,3/CN606 | DH2-0957-000 000 | C | 1 | PRINTED CODE P.I. | |
| CN603/CN2204, CW2701 | DH2-0945-050 000 | C | 1 | CONNECTOR ASS'Y 12P | |

ELECTRICAL PARTS

| SYMBOL | PART NO. | CLASS | QTY | DESCRIPTION | REMARKS |
|---------------------|------------------|-------|-----|----------------------|---------|
| CN605/CN2901 | DH2-0946-000 000 | C | 1 | CONNECTOR ASS'Y 8P | |
| CN612,CN2001/CN2907 | DH2-0947-000 000 | C | 1 | CONNECTOR ASS'Y 6P | |
| CN2002 | VS1-0851-016 000 | C | 1 | CONNECTOR 16P | |
| CN2003 | VS1-0851-009 000 | C | 1 | CONNECTOR 9P | |
| CN2201 | VS1-0850-009 000 | C | 1 | CONNECTOR 9P | |
| CN2202 | VS1-0850-016 000 | C | 1 | CONNECTOR 16P | |
| CN4006/(CN2907) | DH2-0962-000 000 | C | 1 | CONNECTOR ASS'Y 2P | |
| D101 | WAL-0380-000 000 | B | 1 | DIODE MA157 | |
| D102 | WAL-0380-000 000 | B | 1 | DIODE MA157 | |
| D103 | WAL-0380-000 000 | B | 1 | DIODE MA157 | |
| D104 | WAL-0380-000 000 | B | 1 | DIODE MA157 | |
| D106 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D107 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D108 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D109 | WAL-0547-000 201 | B | 1 | DIODE 1SS184 | |
| D110 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D111 | WAL-0547-000 201 | B | 1 | DIODE 1SS184 | |
| D401 | WAL-0612-000 201 | B | 1 | DIODE E10QS03 | |
| D402 | WAL-0612-000 201 | B | 1 | DIODE E10QS03 | |
| D411 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D601 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D602 | WAL-0547-000 201 | B | 1 | DIODE 1SS184 | |
| D603 | WAL-0547-000 201 | B | 1 | DIODE 1SS184 | |
| D604 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D605 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D606 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D607 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D610 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D611 | WAL-0384-000 000 | B | 1 | ZENER DIODE RD5.6MB2 | |
| D612 | WAL-0547-000 201 | B | 1 | DIODE 1SS184 | |
| D614 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D616 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D617 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D618 | WAL-0547-000 201 | B | 1 | DIODE 1SS184 | |
| D619 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D620 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D621 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D622 | WAL-1146-000 000 | B | 1 | DIODE MA707 | |
| D623 | WAL-1146-000 000 | B | 1 | DIODE MA707 | |
| D624 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D2001 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D2002 | WAL-0985-000 000 | B | 1 | DIODE MA341 | |
| D2051 | WAL-0380-000 000 | B | 1 | DIODE MA157 | |
| D2052 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D2053 | WAL-0962-000 000 | B | 1 | DIODE MA121 | |
| D2054 | WAL-0962-000 000 | B | 1 | DIODE MA121 | |
| D2055 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D2201 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D2204 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D2301 | WAL-0380-000 000 | B | 1 | DIODE MA157 | |
| D2302 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D2303 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D2304 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |
| D2601 | WAL-0380-000 000 | B | 1 | DIODE MA157 | |
| D2701 | WAL-0696-000 201 | B | 1 | DIODE MA152WA | |
| D2702 | WAL-0962-000 000 | B | 1 | DIODE MA121 | |
| D2703 | WAL-0962-000 000 | B | 1 | DIODE MA121 | |
| D2704 | WAL-0961-000 000 | B | 1 | DIODE MA112 | |

ELECTRICAL PARTS

| SYMBOL | PART NO. | CLASS | QTY | DESCRIPTION | REMARKS |
|--------|--------------|-------|-----|----------------------------|---------|
| D2901 | WA1-0989-000 | 000 | B 1 | DIODE MA3100W | |
| D2902 | WA1-0961-000 | 000 | B 1 | DIODE MALL2 | |
| D2903 | WA1-1123-000 | 000 | B 1 | DIODE AG01Z | |
| D2904 | WA1-1124-000 | 000 | B 1 | DIODE SHV02 | |
| D2905 | WA1-0961-000 | 000 | B 1 | DIODE MALL2 | |
| D2906 | WA1-0564-000 | 000 | B 1 | ZENER DIODE RD9.1M-T1B | |
| D2951 | WA1-0961-000 | 000 | B 1 | DIODE MALL2 | |
| PT2931 | WE2-0414-000 | 000 | C 1 | FILTER, NOISE | |
| IC101 | DH4-0190-000 | 000 | B 1 | IC CXA1237AR | |
| IC102 | WA4-0509-000 | 201 | B 1 | IC NJM2043M | |
| IC103 | DH4-0192-000 | 000 | B 1 | IC CXA1202R | |
| IC104 | DH4-0196-000 | 000 | B 1 | IC CXA1203N | |
| IC105 | DH4-0180-001 | 000 | B 1 | IC CXA1200BQ | |
| IC106 | DH4-0139-000 | 000 | B 1 | IC CXL1502M | |
| IC107 | DH4-0205-000 | 000 | B 1 | IC LVC556F-2 | |
| IC411 | DH4-0189-000 | 000 | B 1 | IC CXA1127M | |
| IC412 | DH4-0030-000 | 000 | B 1 | IC CX20115 | |
| IC431 | DH4-0029-000 | 000 | B 1 | IC CX20114 | |
| IC441 | DH4-0135-000 | 000 | B 1 | IC CXA1204Q | |
| IC601 | DH4-0204-000 | 000 | B 1 | IC CXP80116 | |
| IC602 | DH4-0181-000 | 000 | B 1 | IC UPC7508G | |
| IC603 | WA4-0905-000 | 000 | B 1 | IC TA7733F-T1 | |
| IC604 | WA4-0681-000 | 201 | B 1 | IC M5236ML | |
| IC605 | WA4-1167-000 | 000 | B 1 | IC RH5RA50A | |
| IC606 | WA4-1145-000 | 000 | B 1 | IC RH5VA45AA (3) | |
| IC607 | WA4-0311-000 | 000 | B 1 | IC NJM2903M | |
| IC608 | WA4-0349-000 | 201 | B 1 | IC NJM2904M | |
| IC2001 | DH4-0124-000 | 000 | B 1 | IC MN53015CXZ | |
| IC2002 | DH4-0125-000 | 000 | B 1 | IC MN53015CXY | |
| IC2051 | WA3-3900-000 | 000 | B 1 | IC UPD6147G | |
| IC2102 | WA4-0901-000 | 000 | B 1 | IC AN20115 | |
| IC2151 | WA3-3679-000 | 000 | B 1 | IC MN3828S | |
| IC2201 | WA4-1075-000 | 000 | B 1 | IC AN2153NS | |
| IC2202 | WA4-0458-000 | 000 | B 1 | IC NJM3414M | |
| IC2203 | WA4-0349-000 | 201 | B 1 | IC NJM2904M | |
| IC2301 | WA4-1076-000 | 000 | B 1 | IC AN2253FA | |
| IC2601 | WA3-3159-000 | 000 | B 1 | IC BU4053BMF | |
| IC2602 | DH4-0134-000 | 000 | B 1 | IC UPD6107G | |
| IC2603 | WA4-0363-000 | 000 | B 1 | IC NJM4556MB | |
| IC2604 | WA3-3572-000 | 000 | B 1 | IC TC4881F | |
| IC2605 | WA4-0264-000 | 000 | B 1 | IC NJM2902M | |
| IC2606 | WA4-0264-000 | 000 | B 1 | IC NJM2902M | |
| IC2607 | WA4-0264-000 | 000 | B 1 | IC NJM2902M | |
| IC2608 | WA4-0349-000 | 201 | B 1 | IC NJM2904M | |
| IC2701 | DH4-0184-000 | 000 | B 1 | IC UPD7564G | |
| IC2702 | WA4-1145-000 | 000 | B 1 | IC R5VA45AA (3) | |
| IC2901 | WA4-0511-000 | 000 | B 1 | IC AN2510S | |
| IC2932 | DH4-0205-000 | 000 | B 1 | IC LVC556F-2 | |
| IC2941 | DH4-0155-000 | 000 | B 1 | IC UPD6145G-101-T1 | |
| L2902 | DH9-0392-000 | 000 | C 1 | COIL 240uH | |
| Q101 | WA2-0393-000 | 201 | B 1 | TRANSISTOR 2SA1162 (GR,BL) | |
| Q102 | WA2-0759-000 | 000 | B 1 | TRANSISTOR D1A144EK | |
| Q103 | WA2-0646-000 | 000 | B 1 | TRANSISTOR 2SD1328 | |
| Q104 | WA2-0646-000 | 000 | B 1 | TRANSISTOR 2SD1328 | |
| Q105 | WA2-0759-000 | 000 | B 1 | TRANSISTOR DTA144EK | |
| Q106 | WA2-0393-000 | 201 | B 1 | TRANSISTOR 2SA1162 (GR,BL) | |
| Q107 | WA2-1232-000 | 000 | B 1 | TRANSISTOR IMZ1-T108 | |
| Q108 | WA2-0393-000 | 201 | B 1 | TRANSISTOR 2SA1162 | |
| Q109 | WA2-0735-000 | 201 | B 1 | TRANSISTOR 2SC2712 (GR,BL) | |
| Q110 | WA2-0735-000 | 201 | B 1 | TRANSISTOR 2SC2712 (GR,BL) | |

ELECTRICAL PARTS

| SYMBOL | PART NO. | CLASS | QTY | DESCRIPTION | REMARKS |
|--------|--------------|-------|-----|----------------------------|---------|
| Q111 | WA2-1452-000 | 000 | B 1 | TRANSISTOR 2SB1073 (Q,R) | |
| Q112 | WA2-1452-000 | 000 | B 1 | TRANSISTOR 2SB1073 (Q,R) | |
| Q115 | WA2-1234-000 | 000 | B 1 | TRANSISTOR IMX2-T108 | |
| Q116 | WA2-0393-000 | 201 | B 1 | TRANSISTOR 2SA1162 (GR,BL) | |
| Q117 | WA2-0735-000 | 201 | B 1 | TRANSISTOR 2SC2712 (GR,BL) | |
| Q118 | WA2-0393-000 | 201 | B 1 | TRANSISTOR 2SA1162 (GR,BL) | |
| Q119 | WA2-1232-000 | 000 | B 1 | TRANSISTOR IMZ1-T108 | |
| Q120 | WA2-1232-000 | 000 | B 1 | TRANSISTOR IMZ1-T108 | |
| Q121 | WA2-1133-000 | 000 | B 1 | TRANSISTOR IMX3-T108 | |
| Q122 | WA2-1237-000 | 000 | B 1 | TRANSISTOR DTA114TK | |
| Q123 | WA2-0393-000 | 201 | B 1 | TRANSISTOR 2SA1162 (GR,BL) | |
| Q124 | WA2-0735-000 | 201 | B 1 | TRANSISTOR 2SC2712 (GR,BL) | |
| Q125 | WA2-1133-000 | 000 | B 1 | TRANSISTOR IMX3-T108 | |
| Q126 | WA2-1229-000 | 000 | B 1 | TRANSISTOR IMH4-T110 | |
| Q127 | WA2-0735-000 | 201 | B 1 | TRANSISTOR 2SC2712 (GR,BL) | |
| Q128 | WA2-0393-000 | 201 | B 1 | TRANSISTOR 2SA1162 (GR,BL) | |
| Q129 | WA2-0735-000 | 201 | B 1 | TRANSISTOR 2SC2712 (GR,BL) | |
| Q130 | WA2-0735-000 | 201 | B 1 | TRANSISTOR 2SC2712 (GR,BL) | |
| Q131 | WA2-0735-000 | 201 | B 1 | TRANSISTOR 2SC2712 (GR,BL) | |
| Q132 | WA2-0393-000 | 201 | B 1 | TRANSISTOR 2SA1162 (GR,BL) | |
| Q133 | WA2-0735-000 | 201 | B 1 | TRANSISTOR 2SC2712 (GR,BL) | |
| Q134 | WA2-0735-000 | 201 | B 1 | TRANSISTOR 2SC2712 (GR,BL) | |
| Q135 | WA2-0735-000 | 201 | B 1 | TRANSISTOR 2SC2712 (GR,BL) | |
| Q136 | WA2-0735-000 | 201 | B 1 | TRANSISTOR 2SC2712 (GR,BL) | |
| Q137 | WA2-0884-000 | 000 | B 1 | TRANSISTOR DTC144EK | |
| Q138 | WA2-1230-000 | 000 | B 1 | TRANSISTOR IMH6-T108 | |
| Q139 | WA2-1230-000 | 000 | B 1 | TRANSISTOR IMH6-T108 | |
| Q140 | WA2-0735-000 | 201 | B 1 | TRANSISTOR 2SC2712 (GR,BL) | |
| Q141 | WA2-0884-000 | 000 | B 1 | TRANSISTOR DTC144EK | |
| Q142 | WA2-1230-000 | 000 | B 1 | TRANSISTOR IMH6-T108 | |
| Q143 | WA2-0884-000 | 000 | B 1 | TRANSISTOR DTC144EK | |
| Q144 | WA2-0735-000 | 201 | B 1 | TRANSISTOR 2SC2712 (GR,BL) | |
| Q145 | WA2-0393-000 | 201 | B 1 | TRANSISTOR 2SA1162 (GR,BL) | |
| Q146 | WA2-0884-000 | 000 | B 1 | TRANSISTOR DTC144EK | |
| Q147 | WA2-1298-000 | 000 | B 1 | TRANSISTOR DTC124TK | |
| Q148 | WA2-0735-000 | 201 | B 1 | TRANSISTOR 2SC2712 (GR,BL) | |
| Q149 | WA2-0393-000 | 201 | B 1 | TRANSISTOR 2SA1162 (GR,BL) | |
| Q152 | WA2-1234-000 | 000 | B 1 | TRANSISTOR IMX2-T108 | |
| Q153 | WA2-0735-000 | 201 | B 1 | TRANSISTOR 2SC2712 (GR,BL) | |
| Q401 | WA2-1368-000 | 000 | B 1 | TRANSISTOR DTC114EK | |
| Q402 | WA2-0797-000 | 201 | B 1 | TRANSISTOR 2SA1213 (Y) | |
| Q403 | WA2-1368-000 | 000 | B 1 | TRANSISTOR DTC114EK | |
| Q404 | WA2-0797-000 | 201 | B 1 | TRANSISTOR 2SA1213 (Y) | |
| Q411 | WA2-0759-000 | 000 | B 1 | TRANSISTOR DTA144EK | |
| Q431 | WA2-0393-000 | 201 | B 1 | TRANSISTOR 2SA1162 (GR,BL) | |
| Q432 | WA2-1198-000 | 000 | B 1 | TRANSISTOR IMD2-T108 | |
| Q601 | WA2-0393-000 | 201 | B 1 | TRANSISTOR 2SA1162 (GR,BL) | |
| Q602 | WA2-0760-000 | 000 | B 1 | TRANSISTOR DTC114TK | |
| Q603 | WA2-1237-000 | 000 | B 1 | TRANSISTOR DTA114TK | |
| Q605 | WA2-1121-000 | 000 | B 1 | TRANSISTOR DTC143EK | |
| Q606 | WA2-1099-000 | 000 | B 1 | TRANSISTOR FMW1-T98 | |
| Q607 | WA2-1237-000 | 000 | B 1 | TRANSISTOR DTA114TK | |
| Q609 | WA2-1099-000 | 000 | B 1 | TRANSISTOR FMW1-T98 | |
| Q610 | WA2-0759-000 | 000 | B 1 | TRANSISTOR DTA144EK | |
| Q611 | WA2-0797-000 | 201 | B 1 | TRANSISTOR 2SA1213 (Y) | |
| Q612 | WA2-0735-000 | 201 | B 1 | TRANSISTOR 2SC2712 (GR,BL) | |
| Q613 | WA2-1202-000 | 000 | B 1 | TRANSISTOR 2SB1121 | |
| Q614 | WA2-1202-000 | 000 | B 1 | TRANSISTOR 2SB1121 | |
| Q615 | WA2-0759-000 | 000 | B 1 | TRANSISTOR DTA144EK | |
| Q616 | WA2-0884-000 | 000 | B 1 | TRANSISTOR DTC144EK | |

ELECTRICAL PARTS

| SYMBOL | PART NO. | CLASS | QTY | DESCRIPTION | REMARKS |
|--------|--------------|-------|-----|-------------|----------------------------|
| Q617 | WA2-0759-000 | 000 | B | 1 | TRANSISTOR DTA144EK |
| Q619 | WA2-1248-000 | 000 | B | 1 | TRANSISTOR DTA124EK |
| Q620 | WA2-0759-000 | 000 | B | 1 | TRANSISTOR DTA144EK |
| Q621 | WA2-1237-000 | 000 | B | 1 | TRANSISTOR DTA114TK |
| Q622 | WA2-1237-000 | 000 | B | 1 | TRANSISTOR DTA114TK |
| Q623 | WA2-1121-000 | 000 | B | 1 | TRANSISTOR DTC143EK |
| Q624 | WA2-0760-000 | 000 | B | 1 | TRANSISTOR DTC114TK |
| Q625 | WA2-0884-000 | 000 | B | 1 | TRANSISTOR DTC144EK |
| Q2001 | WA2-0393-000 | 201 | B | 1 | TRANSISTOR 2SA1162 (GR,BL) |
| Q2002 | WA2-1027-000 | 000 | B | 1 | FET 2SK198 |
| Q2051 | WA2-1234-000 | 000 | B | 1 | TRANSISTOR IMX2-T108 |
| Q2052 | WA2-1172-000 | 000 | B | 1 | TRANSISTOR 2SA1461 |
| Q2053 | WA2-0052-000 | 000 | B | 1 | TRANSISTOR 2SC1621 |
| Q2054 | WA2-1172-000 | 000 | B | 1 | TRANSISTOR 2SA1461 |
| Q2055 | WA2-0052-000 | 000 | B | 1 | TRANSISTOR 2SC1621 |
| Q2056 | WA2-1172-000 | 000 | B | 1 | TRANSISTOR 2SA1461 |
| Q2057 | WA2-0052-000 | 000 | B | 1 | TRANSISTOR 2SC1621 |
| Q2101 | WA2-0735-000 | 201 | B | 1 | TRANSISTOR 2SC2712 (GR,BL) |
| Q2102 | WA2-0735-000 | 201 | B | 1 | TRANSISTOR 2SC2712 (GR,BL) |
| Q2103 | WA2-0735-000 | 201 | B | 1 | TRANSISTOR 2SC2712 (GR,BL) |
| Q2151 | WA2-1234-000 | 000 | B | 1 | TRANSISTOR IMX2-T108 |
| Q2201 | WA2-0735-000 | 201 | B | 1 | TRANSISTOR 2SC2712 (GR,BL) |
| Q2202 | WA2-1256-000 | 000 | B | 1 | TRANSISTOR IMH5-T108 |
| Q2203 | WA2-1256-000 | 000 | B | 1 | TRANSISTOR IMH5-T108 |
| Q2204 | WA2-0735-000 | 201 | B | 1 | TRANSISTOR 2SC2712 (GR,BL) |
| Q2205 | WA2-1232-000 | 000 | B | 1 | TRANSISTOR IMZ1-T108 |
| Q2206 | WA2-0735-000 | 201 | B | 1 | TRANSISTOR 2SC2712 (GR,BL) |
| Q2207 | WA2-0884-000 | 000 | B | 1 | TRANSISTOR DTC144EK |
| Q2208 | WA2-1232-000 | 000 | B | 1 | TRANSISTOR IMZ1-T108 |
| Q2209 | WA2-1232-000 | 000 | B | 1 | TRANSISTOR IMZ1-T108 |
| Q2210 | WA2-1234-000 | 000 | B | 1 | TRANSISTOR IMX2-T108 |
| Q2211 | WA2-1256-000 | 000 | B | 1 | TRANSISTOR IMH5-T108 |
| Q2212 | WA2-1232-000 | 000 | B | 1 | TRANSISTOR IMZ1-T108 |
| Q2213 | WA2-0735-000 | 201 | B | 1 | TRANSISTOR 2SC2712 (GR,BL) |
| Q2214 | WA2-1228-000 | 000 | B | 1 | TRANSISTOR IMT2-T108 |
| Q2215 | WA2-1256-000 | 000 | B | 1 | TRANSISTOR IMH5-T108 |
| Q2216 | WA2-1232-000 | 000 | B | 1 | TRANSISTOR IMZ1-T108 |
| Q2217 | WA2-1232-000 | 000 | B | 1 | TRANSISTOR IMZ1-T108 |
| Q2301 | WA2-1198-000 | 000 | B | 1 | TRANSISTOR IMD2-T108 |
| Q2302 | WA2-1232-000 | 000 | B | 1 | TRANSISTOR IMZ1-T108 |
| Q2304 | WA2-1228-000 | 000 | B | 1 | TRANSISTOR IMT2-T108 |
| Q2305 | WA2-1198-000 | 000 | B | 1 | TRANSISTOR IMD2-T108 |
| Q2306 | WA2-1234-000 | 000 | B | 1 | TRANSISTOR IMX2-T108 |
| Q2307 | WA2-0735-000 | 201 | B | 1 | TRANSISTOR 2SC2712 (GR,BL) |
| Q2308 | WA2-1234-000 | 000 | B | 1 | TRANSISTOR IMX2-T108 |
| Q2309 | WA2-0884-000 | 000 | B | 1 | TRANSISTOR DTC144EK |
| Q2310 | WA2-1228-000 | 000 | B | 1 | TRANSISTOR IMT2-T108 |
| Q2311 | WA2-1256-000 | 000 | B | 1 | TRANSISTOR IMH5-T108 |
| Q2312 | WA2-1234-000 | 000 | B | 1 | TRANSISTOR IMX2-T108 |
| Q2313 | WA2-1234-000 | 000 | B | 1 | TRANSISTOR IMX2-T108 |
| Q2314 | WA2-0884-000 | 000 | B | 1 | TRANSISTOR DTC144EK |
| Q2601 | WA2-1241-000 | 000 | B | 1 | FET 2SK620 |
| Q2602 | WA2-1256-000 | 000 | B | 1 | TRANSISTOR IMH5-T108 |
| Q2603 | WA2-0735-000 | 201 | B | 1 | TRANSISTOR 2SC2712 (GR,BL) |
| Q2701 | WA2-0884-000 | 000 | B | 1 | TRANSISTOR DTC144EK |
| Q2702 | WA2-1198-000 | 000 | B | 1 | TRANSISTOR IMD2-T108 |
| Q2703 | WA2-0884-000 | 000 | B | 1 | TRANSISTOR DTC144EK |
| Q2901 | WA2-0839-000 | 000 | B | 1 | TRANSISTOR 2SA1226 |
| Q2902 | WA2-0393-000 | 201 | B | 1 | TRANSISTOR 2SA1162 (GR,BL) |
| Q2903 | WA2-0481-000 | 000 | B | 1 | TRANSISTOR 2SD968A |

ELECTRICAL PARTS

| SYMBOL | PART NO. | CLASS | QTY | DESCRIPTION | REMARKS |
|--------|--------------|-------|-----|-------------|----------------------------|
| Q2904 | WA2-0393-000 | 201 | B | 1 | TRANSISTOR 2SA1162 (GR,BL) |
| Q2934 | WA2-0797-000 | 201 | B | 1 | TRANSISTOR 2SA1213 (Y) |
| Q2951 | WA2-0393-000 | 201 | B | 1 | TRANSISTOR 2SA1162 (GR,BL) |
| Q2952 | WA2-0735-000 | 201 | B | 1 | TRANSISTOR 2SC2712 (GR,BL) |
| Q2953 | WA2-1133-000 | 000 | B | 1 | TRANSISTOR IMX3-T108 |
| Q2954 | WA2-0735-000 | 201 | B | 1 | TRANSISTOR 2SC2712 (GR,BL) |
| RR101 | DH4-0142-000 | 000 | D | 1 | LINK, IC |
| RR601 | DH4-0144-000 | 000 | D | 1 | LINK, IC ICP-F25 |
| RR2931 | DH4-0141-000 | 000 | D | 1 | LINK, IC |
| RR2932 | DH4-0141-000 | 000 | D | 1 | LINK, IC |
| RR2933 | DH4-0141-000 | 000 | D | 1 | LINK, IC |
| RR2934 | DH4-0166-000 | 000 | D | 1 | LINK, IC |
| SW2701 | WC2-0190-000 | 000 | C | 1 | SWITCH, PUSH |
| SW2702 | WC2-0190-000 | 000 | C | 1 | SWITCH, PUSH |
| SW2703 | WC2-0190-000 | 000 | C | 1 | SWITCH, PUSH |
| SW2704 | WC2-0190-000 | 000 | C | 1 | SWITCH, PUSH |
| SW2705 | WC2-0190-000 | 000 | C | 1 | SWITCH, PUSH |
| SW2706 | WC2-0190-000 | 000 | C | 1 | SWITCH, PUSH |
| SW2707 | WC2-0190-000 | 000 | C | 1 | SWITCH, PUSH |
| SW2971 | WC2-0172-000 | 000 | C | 1 | SWITCH, PUSH |
| T2901 | DH9-0391-000 | 000 | C | 1 | TRANSFORMER, FLYBACK |
| TC601 | VC6-0340-300 | 000 | C | 1 | CAPACITOR, TRIMMER 30pF |
| TH2901 | WA8-0186-000 | 000 | C | 1 | THERMISTOR |
| VC2001 | VC6-3670-100 | 000 | C | 1 | CAPACITOR, VARIABLE |
| VC2002 | VC6-3670-100 | 000 | C | 1 | CAPACITOR, VARIABLE |
| VC2301 | VC6-0340-300 | 000 | C | 1 | CAPACITOR, TRIMMER 30pF |
| VC2941 | VC6-0340-300 | 000 | C | 1 | CAPACITOR, TRIMMER 30pF |
| VL101 | DH6-0234-000 | 000 | C | 1 | FILTER, LC (4.43MHz) |
| VL102 | DH6-0205-000 | 000 | C | 1 | FILTER, LC (5.9MHz) |
| VR101 | VR5-7780-223 | 000 | C | 1 | RESISTOR, VARIABLE 22KΩ |
| VR102 | VR5-7780-103 | 000 | C | 1 | RESISTOR, VARIABLE 10KΩ |
| VR103 | VR5-7780-332 | 000 | C | 1 | RESISTOR, VARIABLE 3.3KΩ |
| VR104 | VR5-7780-223 | 000 | C | 1 | RESISTOR, VARIABLE 22KΩ |
| VR105 | VR5-7780-471 | 000 | C | 1 | RESISTOR, VARIABLE 470Ω |
| VR106 | VR5-7780-222 | 000 | C | 1 | RESISTOR, VARIABLE 2.2KΩ |
| VR107 | VR5-7780-223 | 000 | C | 1 | RESISTOR, VARIABLE 22KΩ |
| VR108 | VR5-7780-103 | 000 | C | 1 | RESISTOR, VARIABLE 10KΩ |
| VR109 | VR5-7780-471 | 000 | C | 1 | RESISTOR, VARIABLE 470Ω |
| VR110 | VR5-7780-332 | 000 | C | 1 | RESISTOR, VARIABLE 3.3KΩ |
| VR111 | VR5-7780-222 | 000 | C | 1 | RESISTOR, VARIABLE 2.2KΩ |
| VR112 | VR5-7780-103 | 000 | C | 1 | RESISTOR, VARIABLE 10KΩ |
| VR401 | VR5-7780-103 | 000 | C | 1 | RESISTOR, VARIABLE 10KΩ |
| VR601 | VR5-7780-222 | 000 | C | 1 | RESISTOR, VARIABLE 2.2KΩ |
| VR602 | VR5-7780-473 | 000 | C | 1 | RESISTOR, VARIABLE 47KΩ |
| VR603 | VR5-7780-223 | 000 | C | 1 | RESISTOR, VARIABLE 22KΩ |
| VR2101 | VR5-5320-103 | 000 | C | 1 | RESISTOR, VARIABLE 10KΩ |
| VR2201 | VR5-7780-472 | 000 | C | 1 | RESISTOR, VARIABLE 4.7KΩ |
| VR2202 | VR5-7780-103 | 000 | C | 1 | RESISTOR, VARIABLE 10KΩ |
| VR2203 | VR5-7780-472 | 000 | C | 1 | RESISTOR, VARIABLE 4.7KΩ |
| VR2204 | VR5-7780-222 | 000 | C | 1 | RESISTOR, VARIABLE 2.2KΩ |
| VR2205 | VR5-7780-103 | 000 | C | 1 | RESISTOR, VARIABLE 10KΩ |
| VR2206 | VR5-7780-103 | 000 | C | 1 | RESISTOR, VARIABLE 10KΩ |
| VR2207 | VR5-7780-222 | 000 | C | 1 | RESISTOR, VARIABLE 2.2KΩ |
| VR2209 | VR5-7780-103 | 000 | C | 1 | RESISTOR, VARIABLE 10KΩ |
| VR2301 | VR5-7780-103 | 000 | C | 1 | RESISTOR, VARIABLE 10KΩ |
| VR2302 | VR5-7780-472 | 000 | C | 1 | RESISTOR, VARIABLE 4.7KΩ |
| VR2303 | VR5-7780-103 | 000 | C | 1 | RESISTOR, VARIABLE 10KΩ |
| VR2304 | VR5-7780-103 | 000 | C | 1 | RESISTOR, VARIABLE 10KΩ |
| VR2305 | VR5-7780-472 | 000 | C | 1 | RESISTOR, VARIABLE 4.7KΩ |
| VR2306 | VR5-7780-103 | 000 | C | 1 | RESISTOR, VARIABLE 10KΩ |

ELECTRICAL PARTS

PARTS LIST

| SYMBOL | PART NO. | CLASS | QTY | DESCRIPTION | REMARKS | PAGE | PART NO. | CLASS | QTY | DESCRIPTION | REMARKS |
|--------|------------------|-------|-----|------------------------------------|---------|------|------------------|-------|-----|-------------------------------|-----------|
| VR2601 | VR5-7780-472 000 | C | 1 | RESISTOR, VARIABLE 4.7KΩ | | 2 | DA1-1557-000 000 | B | 1 | ACCESSORY, SHOE | |
| VR2602 | VR5-7780-472 000 | C | 1 | RESISTOR, VARIABLE 4.7KΩ | | 2 | DA1-1573-000 000 | B | 1 | EYE CUP RUBBER | |
| VR2603 | VR5-7780-472 000 | C | 1 | RESISTOR, VARIABLE 4.7KΩ | | 2 | DA1-1598-000 000 | B | 1 | SPRING, ACCESSORY SHOE | |
| VR2604 | VR5-7780-472 000 | C | 1 | RESISTOR, VARIABLE 4.7KΩ | | 2 | DA1-1702-000 000 | B | 1 | HOOD | |
| VR2901 | VR5-7680-502 000 | C | 1 | RESISTOR, VARIABLE 5KΩ | | 4 | DA1-1802-000 000 | C | 1 | HOLDER, CAMERA 2 | |
| VR2902 | VR5-7680-201 000 | C | 1 | RESISTOR, VARIABLE 200Ω | | 4 | DA1-1811-000 000 | C | 2 | CUSHION, RUBBER | |
| VR2903 | VR5-4640-205 000 | C | 1 | RESISTOR, VARIABLE 2MΩ | | 4 | DA1-1815-000 000 | C | 2 | SCREW | |
| VR2904 | VR5-4640-504 000 | C | 1 | RESISTOR, VARIABLE 500KΩ | | 6 | DA1-1822-000 000 | C | 1 | HOLDER, RECORDER (3) | |
| VR2931 | VR5-7680-102 000 | C | 1 | RESISTOR, VARIABLE 1KΩ | | 2 | DA1-1834-000 000 | B | 1 | COVER, BATTERY | |
| X101 | DH9-0346-000 000 | C | 1 | OSCILLATOR, CRYSTAL (4.43MHz) | | 2 | DA1-1835-000 000 | C | 1 | RING, RUBBER | |
| X441 | WK2-0467-000 000 | C | 1 | OSCILLATOR, CRYSTAL (5.85MHz) | | 2 | DA1-1840-000 000 | A | 2 | SEAL | |
| X601 | DH9-0363-000 000 | C | 1 | OSCILLATOR, CRYSTAL (8MHz) | | 2 | DA1-1848-000 000 | B | 1 | COVER, RF | |
| X602 | WK2-0508-000 000 | C | 1 | OSCILLATOR, CRYSTAL (32.768KHz) | | 2 | DA1-1853-000 000 | C | 2 | TERMINAL, BATTERY | |
| X2001 | DH9-0376-000 000 | C | 1 | OSCILLATOR, CRYSTAL (19.3125MHz) | | 2 | DA1-1854-000 000 | C | 1 | MASK, CRT | |
| X2002 | DH9-0422-000 000 | C | 1 | OSCILLATOR, CRYSTAL (17.734475MHz) | | 2 | DA1-1855-000 000 | C | 1 | RUBBER, MASK | |
| X2701 | WK2-0518-000 000 | C | 1 | OSCILLATOR, CERA. (700KHz) | | 2 | DA1-1856-000 000 | C | 1 | HOLDER, MASK | |
| | | | | | | 2 | DA1-1857-000 000 | C | 1 | KNOB, BATTERY | |
| | | | | | | 2 | DA1-1860-000 000 | C | 1 | TELE. WIDE KNOB | |
| | | | | | | 2 | DA1-1862-000 000 | C | 1 | PLATE | |
| | | | | | | 2 | DA1-1864-000 000 | B | 1 | RING, RUBBER | |
| | | | | | | 2 | DA1-1866-000 000 | B | 1 | STRAP, HAND | |
| | | | | | | 6 | DA1-1884-000 000 | C | 1 | CASE, SHIELD | |
| | | | | | | 6 | DA1-1895-000 000 | F | 2 | SCREW | |
| | | | | | | 6 | DA1-1900-000 000 | C | 1 | SCREW | |
| | | | | | | 2 | DA1-1931-000 000 | C | 4 | STEEL BALL, SUJ (2) | |
| | | | | | | 2 | DA1-1940-000 000 | C | 1 | SEAL, PC | |
| | | | | | | 6 | DA1-1945-000 000 | C | 1 | HOLDER, RECORDER (4) | |
| | | | | | | 6 | DA1-1948-000 000 | C | 2 | SCREW | |
| | | | | | | 4 | DA1-2138-000 000 | C | 1 | SHEET | |
| | | | | | | 2 | DA1-2147-000 000 | C | 2 | CUSHION | |
| | | | | | | 4 | DA7-1620-000 000 | C | 1 | BAR, ZOOMING | |
| | | | | | | 4 | DA7-1717-000 000 | C | 1 | ZOOM CAM | |
| | | | | | | 4 | DA7-1724-000 000 | C | 1 | STOPPER, NEARDISTANCE | |
| | | | | | | 4 | DA7-1727-000 000 | C | 1 | SPRING, PLATE | |
| | | | | | | 4 | DA7-1728-000 000 | C | 1 | SHEET, ZOOM | |
| | | | | | | 4 | DA7-1730-000 000 | C | 1 | BLIND, IG METER (A) | |
| | | | | | | 4 | DA7-1734-000 000 | C | 1 | STOPPER, RUBBER | |
| | | | | | | 4 | DA7-1737-000 000 | F | 1 | SET SCREW | |
| | | | | | | 4 | DA7-1738-000 000 | C | 1 | SHIELD, LIGHT SPONGE RUBBER | |
| | | | | | | 4 | DA7-1739-000 000 | C | 1 | COVER, IG METER | |
| | | | | | | 2 | DF1-0406-060 000 | B | 1 | CAP, LENS | |
| | | | | | | 2 | DF1-0431-000 000 | C | 1 | COVER, CASSETTE | E80E ONLY |
| | | | | | | 2 | DF1-0432-000 000 | C | 1 | COVER, CASSETTE | E80F ONLY |
| | | | | | | 4 | DF1-0436-010 000 | C | 1 | CONTACT, BATTERY | |
| | | | | | | 6 | DF1-0442-000 000 | C | 1 | HOLDER, RECORDER (1) | |
| | | | | | | 6 | DF1-0443-000 000 | C | 1 | HOLDER, RECORDER (2) | |
| | | | | | | 6 | DF1-0444-000 000 | C | 1 | PRINTED CORD P.I. W/CONNECTOR | |
| | | | | | | | DF1-0446-000 000 | C | 1 | CONNECTOR ASS'Y 6P | |
| | | | | | | 4 | DF1-0448-000 000 | C | 1 | HOLDER, CAMERA 1 | |
| | | | | | | 2 | DF1-0449-000 000 | C | 1 | PLATE, GRIP | |
| | | | | | | 4 | DF7-0227-000 000 | C | 1 | BLIND, IG METER (B) | |
| | | | | | | 6 | DG1-0477-000 000 | C | 1 | RECORDER KEY (1) C.B.A. | |
| | | | | | | 6 | DG1-0478-000 000 | C | 1 | RECORDER KEY (2) C.B.A. | |
| | | | | | | 4 | DG1-0484-010 000 | C | 1 | CAMERA KEY C.B.A. | |
| | | | | | | 2 | DG1-0485-000 000 | C | 1 | REMOCON C.B.A. | |
| | | | | | | 4 | DG1-0486-000 000 | C | 1 | PIN. JACK C.B.A. | |
| | | | | | | 2 | DG1-0498-000 000 | B | 1 | FINDER ASS'Y | |
| | | | | | | 4 | DG1-0499-000 000 | C | 1 | MIC. JACK C.B.A. | |
| | | | | | | 6 | DG1-0525-001 000 | C | 1 | CT C.B.A. | |
| | | | | | | 6 | DG1-0529-000 000 | C | 1 | SYSCON SERVO C.B.A. | |

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| 6 | DG1-0530-000 000 | C | 1 | AUDIO VIDEO C.B.A. | |
| 4 | DG1-0533-000 000 | C | 1 | SENSOR C.B.A. | |
| 4 | DG1-0534-000 000 | C | 1 | PROCESS C.B.A. | |
| 2 | DG1-0550-000 000 | C | 1 | GRIP C.B.A. | |
| 4 | DG9-3306-000 000 | C | 1 | RELAY LENS ASS'Y | |
| 4 | DG9-3310-000 000 | C | 1 | AF MOTOR ASS'Y D.C. 10W UNDER | |
| 4 | DG9-3311-000 000 | C | 1 | PZ MOTOR ASS'Y D.C. 10W UNDER | |
| 4 | DG9-3340-000 000 | C | 1 | VARIATOR LENS ASS'Y | |
| 4 | DG9-3341-000 000 | C | 1 | COMPENSATOR LENS ASS'Y | |
| 4 | DG9-3342-000 000 | C | 1 | RELAY HOLDER ASS'Y | |
| 4 | DG9-3372-000 000 | C | 1 | AF MAIN C.B.A. | |
| 4 | DG9-3382-000 000 | C | 1 | ZOOM RING ASS'Y | |
| | DH2-0944-040 000 | C | 1 | CONNECTOR ASS'Y 6P | |
| | DH2-0945-050 000 | C | 1 | CONNECTOR ASS'Y 12P | |
| | DH2-0946-000 000 | C | 1 | CONNECTOR ASS'Y 8P | |
| | DH2-0947-000 000 | C | 1 | CONNECTOR ASS'Y 6P | |
| | DH2-0951-000 000 | C | 1 | CONNECTOR ASS'Y 3P | |
| | DH2-0952-000 000 | C | 1 | CONNECTOR ASS'Y 3P | |
| | DH2-0957-000 000 | C | 1 | PRINTED CODE P.I. | |
| | DH2-0962-000 000 | C | 1 | CONNECTOR ASS'Y 2P | |
| 4 | DH3-0011-000 000 | C | 1 | DC/DC CONVERTER | |
| | DH4-0029-000 000 | B | 1 | IC CX20114 | |
| | DH4-0030-000 000 | B | 1 | IC CX20115 | |
| | DH4-0124-000 000 | B | 1 | IC MN53015CXZ | |
| | DH4-0125-000 000 | B | 1 | IC MN53015CXY | |
| | DH4-0134-000 000 | B | 1 | IC UPD6107G | |
| | DH4-0135-000 000 | B | 1 | IC CXAL1204Q | |
| | DH4-0139-000 000 | B | 1 | IC CKL1502M | |
| | DH4-0141-000 000 | D | 3 | LINK, IC | |
| | DH4-0142-000 000 | D | 1 | LINK, IC | |
| | DH4-0144-000 000 | D | 1 | LINK, IC ICP-F25 | |
| | DH4-0155-000 000 | B | 1 | IC UPD6145G-101-T1 | |
| | DH4-0166-000 000 | D | 1 | LINK, IC | |
| | DH4-0180-001 000 | B | 1 | IC CXAL200BQ | |
| | DH4-0181-000 000 | B | 1 | IC UPC7508G | |
| | DH4-0184-000 000 | B | 1 | IC UPD7564G | |
| | DH4-0189-000 000 | B | 1 | IC CXAL127M | |
| | DH4-0190-000 000 | B | 1 | IC CXAL237AR | |
| | DH4-0192-000 000 | B | 1 | IC CXAL202R | |
| | DH4-0196-000 000 | B | 1 | IC CXAL203N | |
| | DH4-0204-000 000 | B | 1 | IC CXP80116 | |
| | DH4-0205-000 000 | B | 2 | IC LVC556F-2 | |
| 4 | DH4-0206-000 000 | B | 1 | CCD MN3745FC | |
| | DH6-0205-000 000 | C | 1 | FILTER, LC (5.9MHz) | |
| | DH6-0234-000 000 | C | 1 | FILTER, LC (4.43MHz) | |
| 4 | DH8-0043-000 000 | C | 1 | IG METER | |
| 2 | DH9-0323-000 000 | D | 1 | CRT | |
| | DH9-0346-000 000 | C | 1 | OSCILLATOR, CRYSTAL (4.43MHz) | |
| | DH9-0363-000 000 | C | 1 | OSCILLATOR, CRYSTAL (8MHz) | |
| | DH9-0376-000 000 | C | 1 | OSCILLATOR, CRYSTAL (19.3125MHz) | |
| 2 | DH9-0389-000 000 | C | 1 | MICROPHONE | |
| | DH9-0391-000 000 | C | 1 | TRANSFORMER, FLYBACK | |
| | DH9-0392-000 000 | C | 1 | COIL 240uH | |
| 2 | DH9-0393-000 000 | C | 1 | DEFLECTION YOKE | |
| | DH9-0422-000 000 | C | 1 | OSCILLATOR, CRYSTAL (17.734475MHz) | |
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| 2 | DY1-1065-000 000 | B | 1 | RIGHT COVER, GRIP | E80E ONLY |
| 2 | DY1-1066-000 000 | B | 1 | RIGHT COVER, GRIP | E80F ONLY |
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| 4 | DY1-7098-000 000 | C | 1 | ZOOM LENS ASS'Y | |

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| 2 | DY2-1071-000 000 | B | 1 | LEFT COVER, GRIP | |
| 2 | DY2-1087-000 000 | B | 1 | TOP COVER ASS'Y | E80E ONLY |
| 2 | DY2-1088-000 000 | B | 1 | TOP COVER ASS'Y | E80F ONLY |
| 2 | DY2-1089-000 000 | B | 1 | RIGHT COVER ASS'Y | E80E ONLY |
| 2 | DY2-1090-000 000 | B | 1 | RIGHT COVER ASS'Y | E80F ONLY |
| 2 | DY2-1091-000 000 | B | 1 | REAR COVER ASS'Y | E80E ONLY |
| 2 | DY2-1092-000 000 | B | 1 | REAR COVER ASS'Y | E80F ONLY |
| 2 | DY2-1101-000 000 | B | 1 | LEFT COVER ASS'Y | |
| 2 | DY2-6014-000 000 | C | 1 | WIRELESS CONTROLLER | E80E ONLY |
| 2 | DY2-6016-000 000 | C | 1 | WIRELESS CONTROLLER | E80F ONLY |
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| 8 | DY4-2452-000 000 | F | 3 | SCREW | |
| 12 | DY4-2527-000 000 | F | 1 | WASHER | |
| 12 | DY4-2648-000 000 | C | 1 | COASTER, LEFT | |
| 12 | DY4-2649-000 000 | C | 1 | COASTER, RIGHT | |
| 12 | DY4-2650-000 000 | C | 1 | GEAR ASS'Y | |
| 8 | DY4-2651-000 000 | C | 1 | LOADING MOTOR ASS'Y | |
| 8 | DY4-2652-000 000 | C | 1 | ROLLER ASS'Y | |
| 10 | DY4-2653-000 000 | C | 1 | ARM, PINCH | |
| 12 | DY4-2654-000 000 | C | 1 | GEAR ASS'Y | |
| 12 | DY4-2655-000 000 | C | 1 | LEVER, THREADING | |
| 12 | DY4-2656-000 000 | C | 1 | GEAR, JOINT | |
| 10 | DY4-2657-000 000 | C | 1 | LEVER, SWITCH | |
| 12 | DY4-2658-000 000 | C | 1 | WORM ASS'Y | |
| 12 | DY4-2659-000 000 | C | 1 | BRAKE, TS | |
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| 12 | DY4-2661-000 000 | C | 1 | GEAR | |
| 12 | DY4-2662-000 000 | C | 1 | ROLLER | |
| 10 | DY4-2663-000 000 | C | 1 | REEL, SUPPLY | |
| 10 | DY4-2664-000 000 | C | 1 | ARM, TG7 | |
| 12 | DY4-2665-000 000 | C | 1 | ARM, PINCH SUB | |
| 10 | DY4-2666-000 000 | C | 1 | REEL, TAKE UP | |
| 12 | DY4-2667-000 000 | C | 1 | GEAR | |
| 12 | DY4-2668-000 000 | C | 1 | GEAR | |
| 10 | DY4-2669-000 000 | C | 1 | ARM | |
| 12 | DY4-2670-000 000 | C | 1 | CHASSIS ASS'Y | |
| 12 | DY4-2671-000 000 | C | 1 | PULLY, RELAY | |
| 12 | DY4-2672-000 000 | C | 1 | PLATE, SS | |
| 8 | DY4-2673-000 000 | C | 1 | CASSETTE COMPARTMENT ASS'Y | |
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| 8 | DY4-2675-000 000 | C | 1 | TERMINAL, EARTH | |
| 10 | DY4-2676-000 000 | C | 1 | SWITCH | |
| 10 | DY4-2677-000 000 | C | 1 | SWITCH, SLIDE | |
| 10 | DY4-2678-000 000 | C | 1 | SWITCH, PUSH | |
| 10 | DY4-2679-000 000 | C | 1 | FLEXIBLE C.B.A. (1) | |
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| 10,12 | DY4-2681-000 000 | F | 4 | WASHER | |
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| 12 | DY4-2685-000 000 | C | 2 | SPRING, LEAF | |
| 12 | DY4-2686-000 000 | F | 2 | SCREW | |
| 12 | DY4-2687-000 000 | C | 1 | GEAR, WHEEL | |
| 10,12 | DY4-2688-000 000 | F | 6 | WASHER | |
| 12 | DY4-2689-000 000 | F | 2 | SCREW | |
| 10 | DY4-2690-000 000 | C | 1 | PLATE, TL | |
| 10 | DY4-2691-000 000 | C | 1 | BRAKE, LB | |
| 10 | DY4-2692-000 000 | C | 1 | LEVER, LB | |
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| 10 | DY4-2697-000 000 | C | 1 | SPRING, COIL | |
| 12 | DY4-2698-000 000 | C | 1 | SPRING, COIL | |
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| 10 | DY4-2701-000 000 | C | 1 | FRANGE, TG2 | |
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| 10 | DY4-2705-000 000 | C | 1 | SPRING, COIL | |
| 12 | DY4-2706-000 000 | C | 1 | SPRING, COIL | |
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| 10 | DY4-2710-000 000 | C | 1 | HOLDER, LED | |
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| | VC5-0070-226 000 | C | 1 | CAPACITOR, TANTA. 22μF 6.3V | |
| | VC5-0070-335 000 | C | 2 | CAPACITOR, TANTA. 3.3μF 6.3V | |
| | VC5-0090-104 000 | C | 1 | CAPACITOR, TANTA. 0.1μF 35V | |
| | VC5-0090-473 000 | C | 1 | CAPACITOR, TANTA. 0.047μF 35V | |
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| | VC5-0700-225 000 | C | 2 | CAPACITOR, TANTA. 2.2μF 6.3V | |
| | VC5-0700-226 000 | C | 1 | CAPACITOR, TANTA. 22μF 10V | |
| | VC5-5030-474 000 | C | 5 | CAPACITOR, TANTA. 0.47μF 20V | |
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| | VC5-9520-102 000 | C | 1 | CAPACITOR, CERA. 1000pF 1KV | |
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| | VR5-4640-205 000 | C | 1 | RESISTOR, VARIABLE 2MΩ | |
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| 2,4,6 | XA1-7200-357 | 000 | F | 12 | SCREW, CROSS-RECESS, PH |
| 2 | XA1-7200-359 | 000 | F | 3 | SCREW, CROSS-RECESS, PH |
| 2 | XA1-7200-459 | 000 | F | 13 | SCREW, CROSS-RECESS, PH |
| 2 | XA1-7260-709 | 000 | F | 4 | SCREW, CROSS-RECESS, PH |
| 4 | XA4-2170-707 | 000 | F | 2 | SCREW, CROSS-RECESS, TAPPING |
| 4 | XA4-4170-407 | 000 | F | 1 | SCREW, CROSS-RECESS, PH |
| 4 | XA4-4170-409 | 000 | F | 1 | SCREW, CROSS-RECESS, PH |
| 4 | XA4-4170-507 | 000 | F | 1 | SCREW, CROSS-RECESS, PH |
| 4 | XA4-4200-507 | 000 | F | 1 | SCREW, CROSS-RECESS, PH |
| 2 | XA4-7200-459 | 000 | F | 3 | SCREW, CROSS-RECESS, PH |
| 4 | XA4-9170-557 | 000 | F | 3 | SCREW, CROSS-RECESS, PH |
| 4 | XA4-9200-209 | 000 | F | 2 | SCREW |
| 4 | XA4-9200-609 | 000 | F | 9 | SCREW, CROSS-RECESS, PH |
| 2 | XA9-0435-010 | 000 | F | 2 | SCREW, CROSS-RECESS, TAPPING |
| 2 | XB1-1300-809 | 000 | F | 2 | SCREW |
| 4 | XB4-6260-607 | 000 | F | 1 | SCREW M2.6x6 |
| 4 | X96-1723-610 | 000 | F | 2 | SCREW, SLOTTED, SHOULDER |
| 2 | Y22-2311-000 | 000 | B | 1 | COVER WIRELESS CONTROLLER |
| 8 | Y22-8012-000 | 000 | B | 1 | LED GL452S |
| 8 | Y22-8120-000 | 000 | B | 1 | SENSOR, DEW |
| 10 | Y22-8121-000 | 000 | B | 2 | SENSOR, PHOTO TLP907-0 |
| 10 | Y22-8123-000 | 000 | B | 2 | PHOTO TRANSISTOR EE-P109 |

CHAPTER V. DIAGRAMS

| | | |
|-----|--|------------|
| 1. | Interconnection Diagram | N - 1 |
| 2. | Block Diagrams | |
| 2-1 | Camera Section | N - 2 |
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| 3. | Circuit Board/Schematic Diagrams | |
| 3-1 | SENSOR C.B.A. | N - 5, 6 |
| 3-2 | PROCESS CAMERA-KERY C.B.A. | N - 7, 8 |
| 3-3 | SYSCON-SERVO C.B.A. | N - 9, 10 |
| 3-4 | AUDIO-VIDEO C.B.A. | N - 11, 12 |
| 3-5 | GRIP C.B.A. | N - 13, 14 |

<Guide to diagrams>

1. Color coding

(1) Voltage on circuit diagram

| | |
|-------|-------------|
| RED | : Recording |
| BLACK | : Playback |

(2) Signal lines on circuit diagram

| | |
|---------------|---------------------------|
| BLUE | : Luminance |
| ORANGE | : Chrominance |
| HATCHED BLACK | : Luminance + Chrominance |
| RED | : Power supply line |

(3) PC board layout

| | |
|---------------|-----------------------------------|
| ORANGE | : Pattern on component side |
| HATCHED BLACK | : Pattern on soldered side |
| BLACK | : Parts mounted on component side |
| BLUE | : Parts mounted on soldered side |

(4) Remarks.

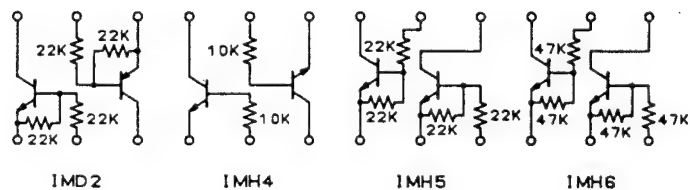
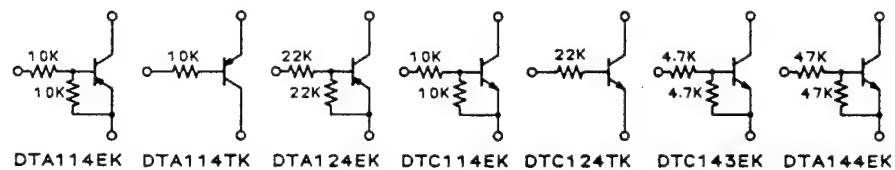
Sensor C.B.A. consists of four layers.

The patterns of GND and power supply (+5V), which are omitted from this diagram, are installed between the printed and component sides.

⊙ : Denotes that it is connected to +5V pattern.

⊗ : Denotes that it is connected to GND.

2. Equivalent circuits of digital transistors are shown below. (Transistors on E/D are circled with broken lines.)



3. Indications on circuit diagram

- 1) Resistance is represented in ohms (Ω).
- 2) Capacitance is represented in farads (F).
- 3) Wattage of resistor is 1/16 W unless otherwise specified.
- 4) Voltages (digital voltmeter used) and waveforms (10:1 probe used) indicated on circuit diagram are measured under the following conditions.

<Camera section>

- * Colorbar standard view angle, AWB preset state

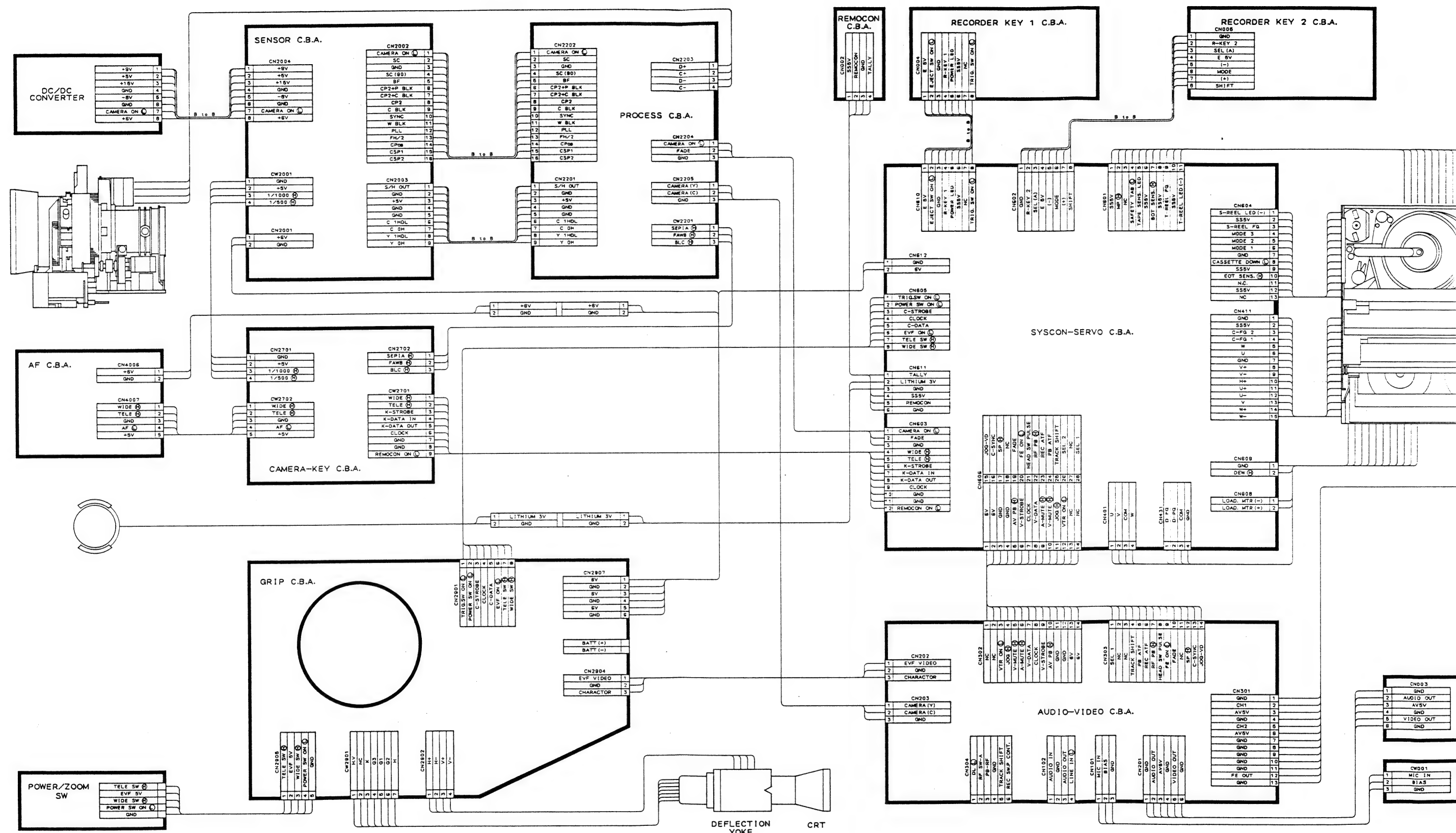
<Recorder section>

- * Recording : Colorbar (pattern generator)
- * Playback : Self-recording → Playback (colorbar)

<Grip section>

- * Colorbar (pattern generator)

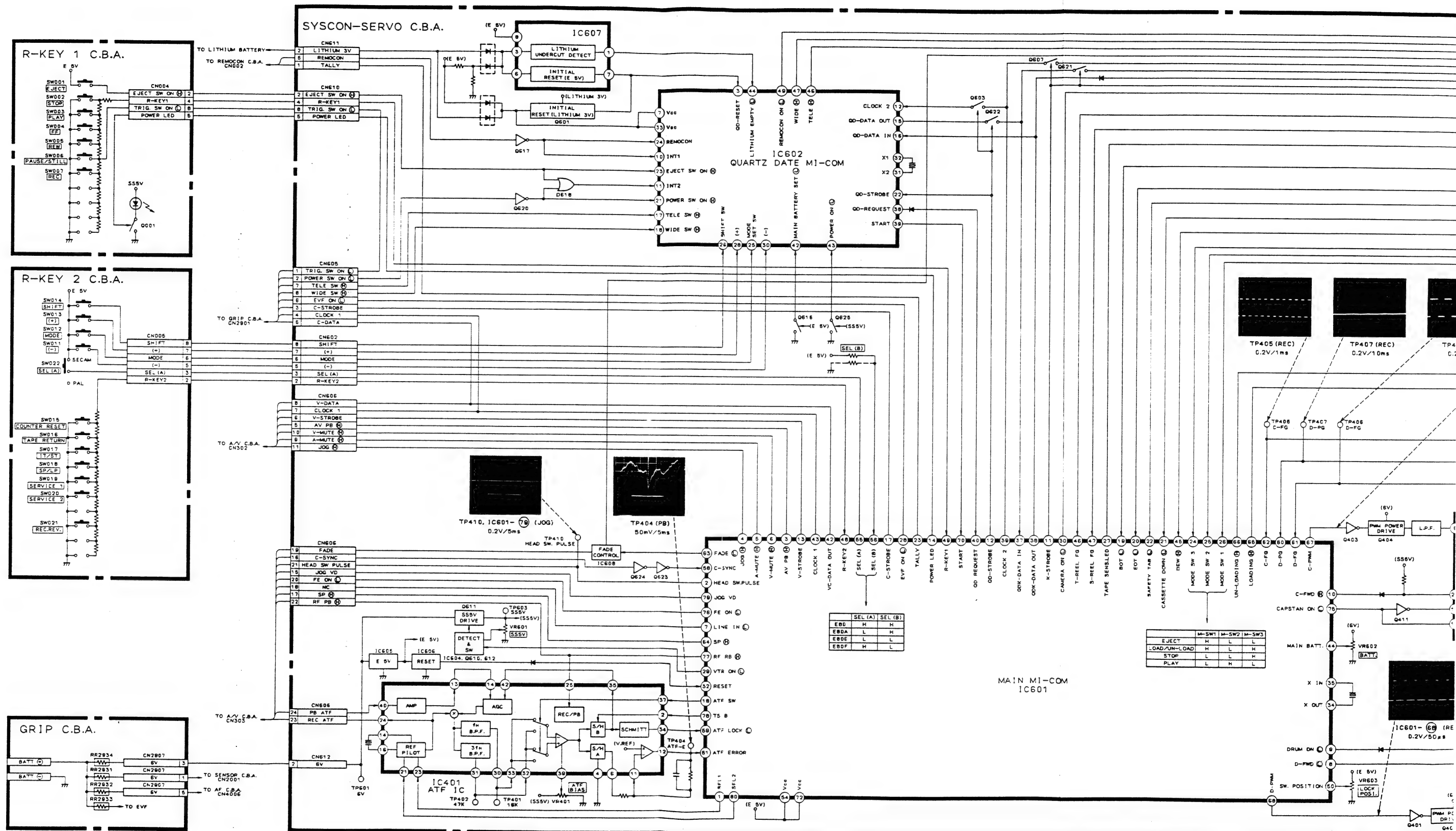
INTERCONNECTION DIAGRAM

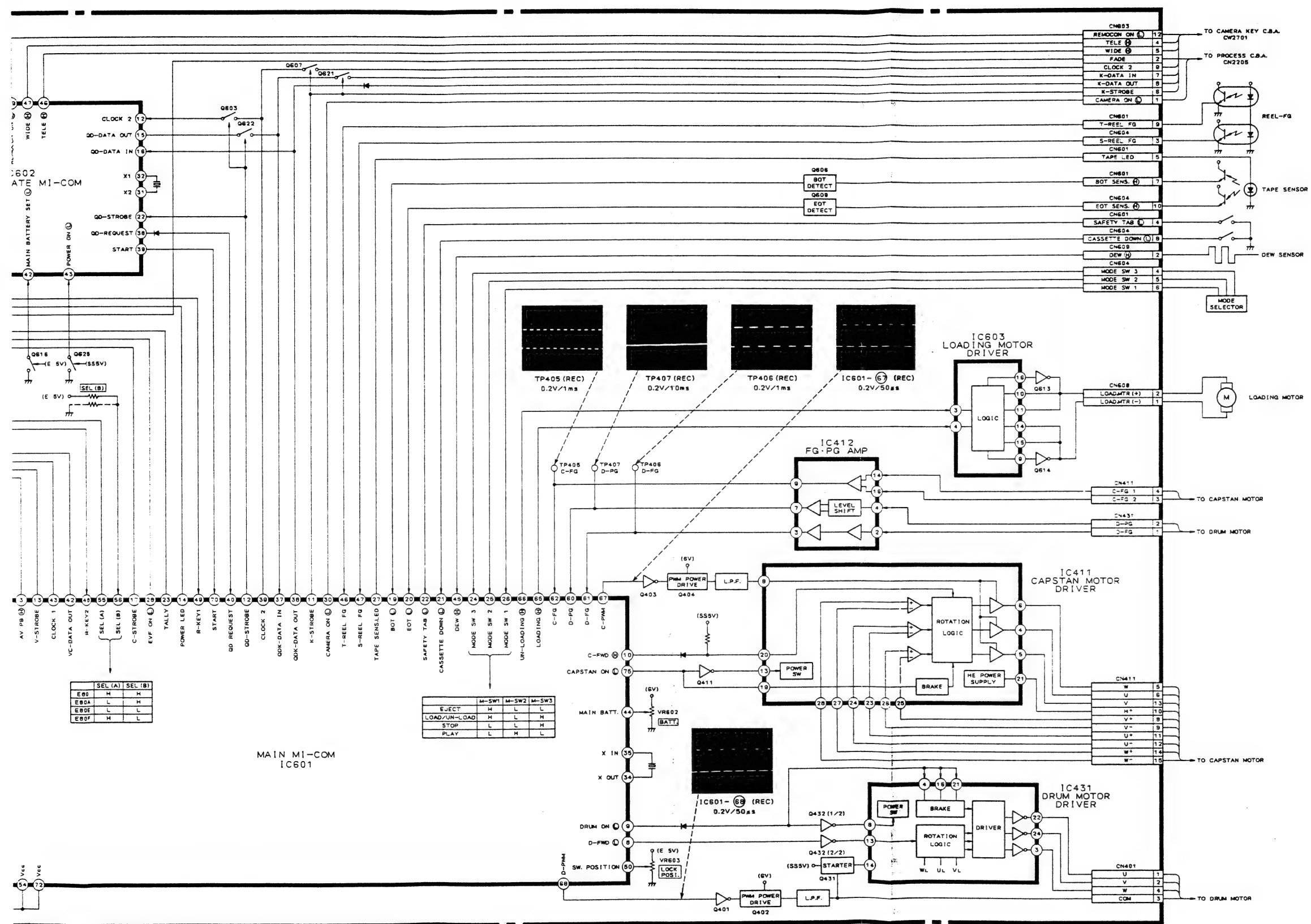


01 Feb. 1989

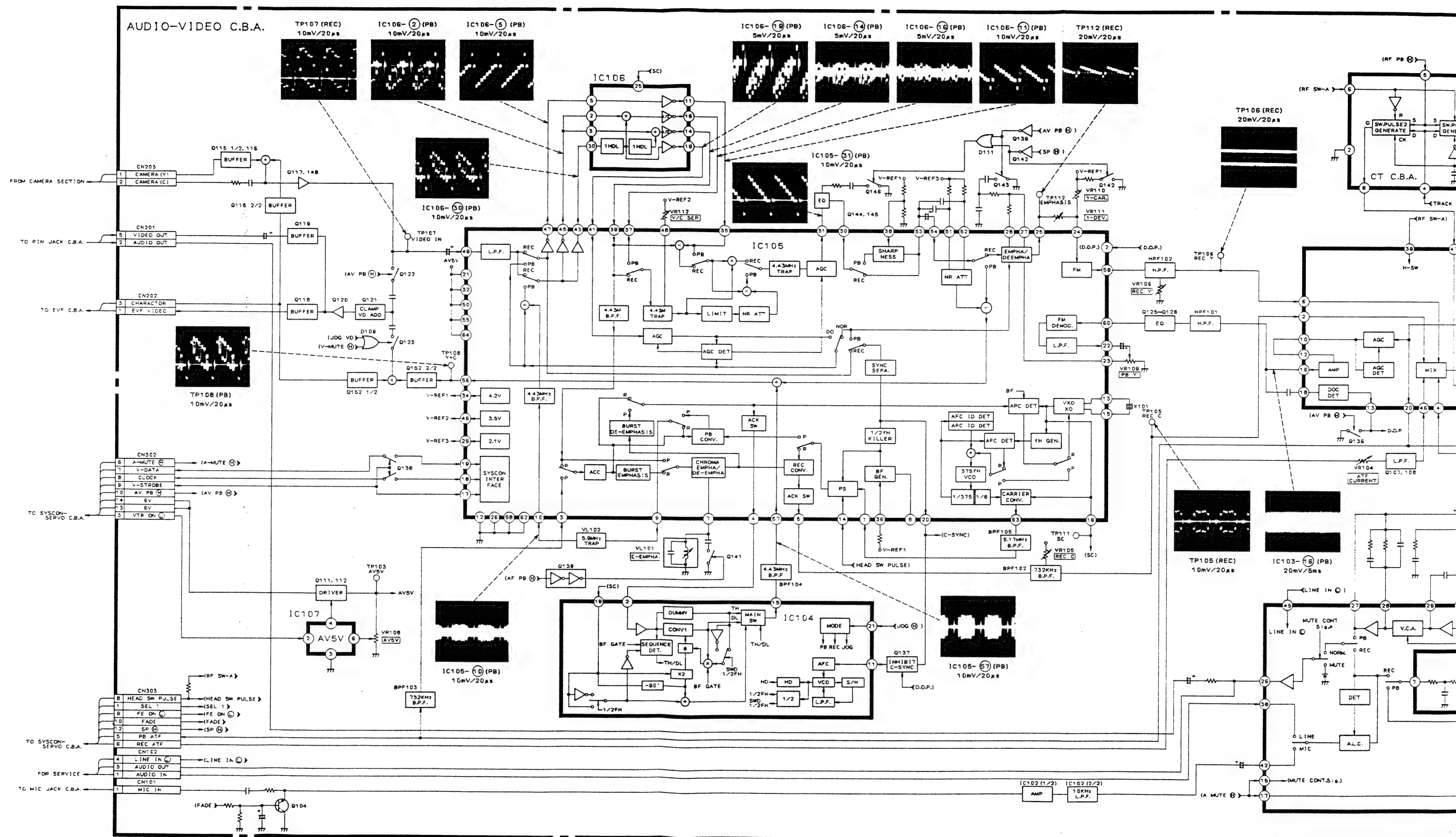


BLOCK DIAGRAM SYSCON-SERVO SECTION

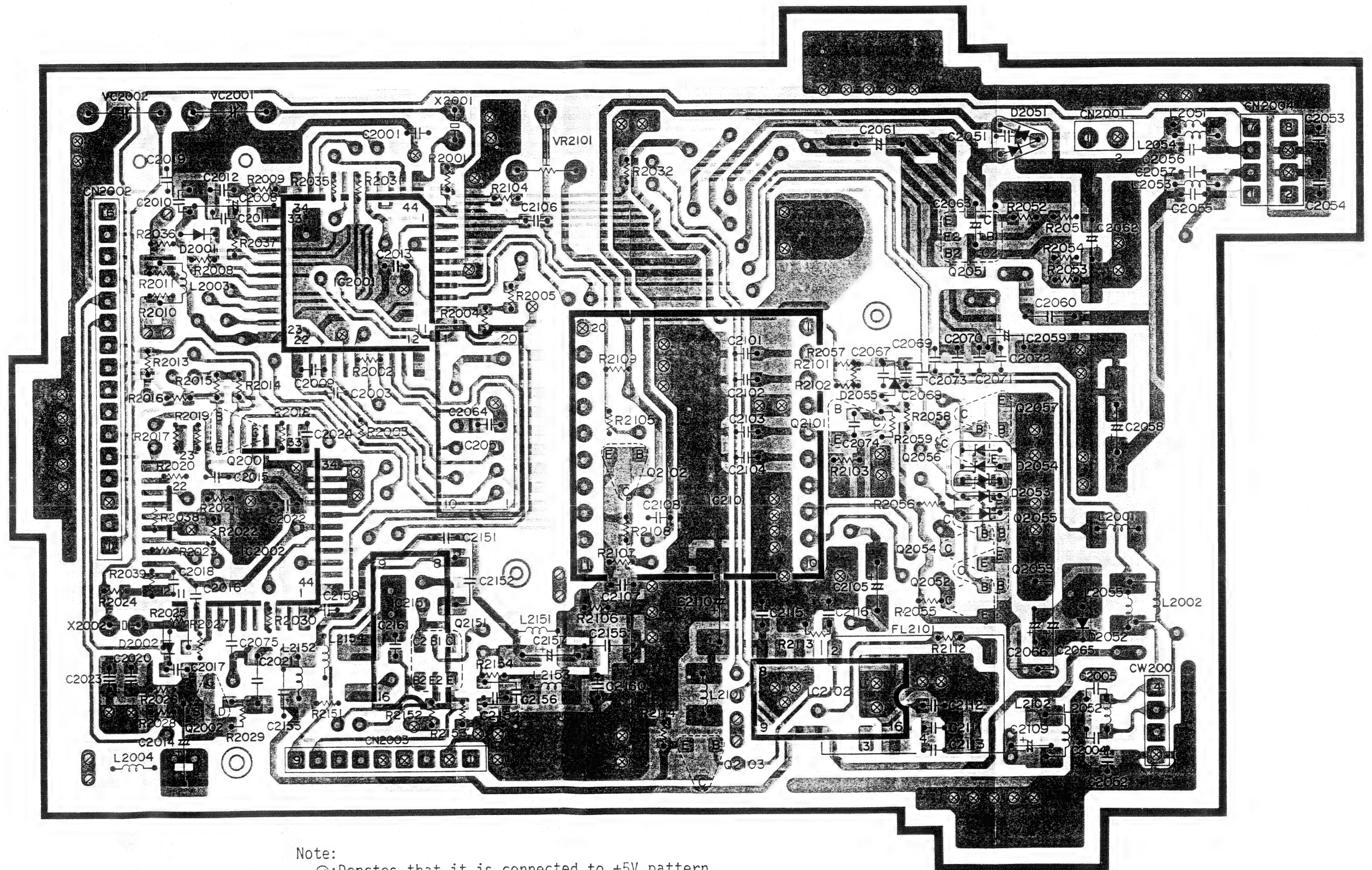




BLOCK DIAGRAM AUDIO-VIDEO SECTION

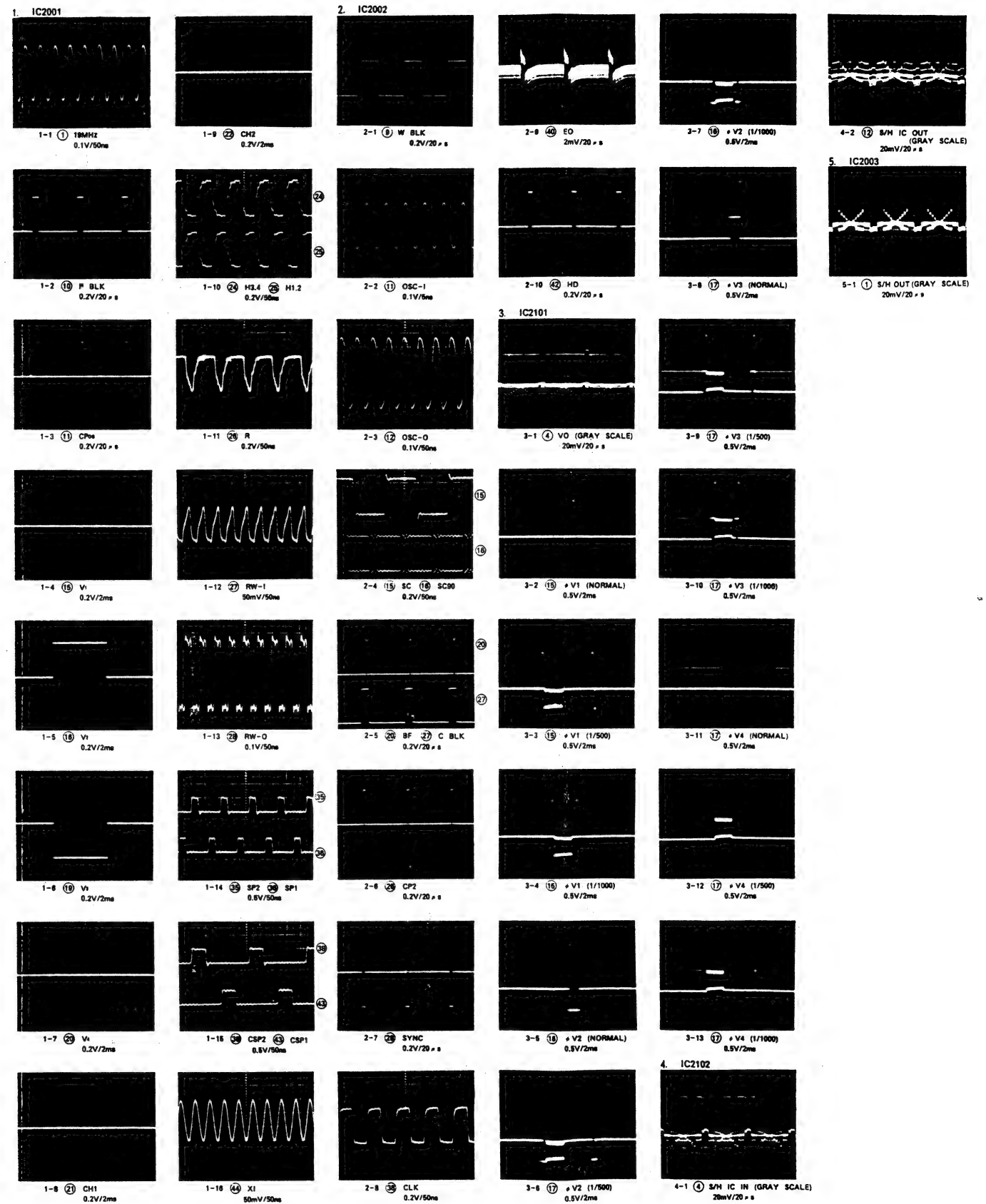


CIRCUIT BOARD DIAGRAM SENSOR C.B.A.

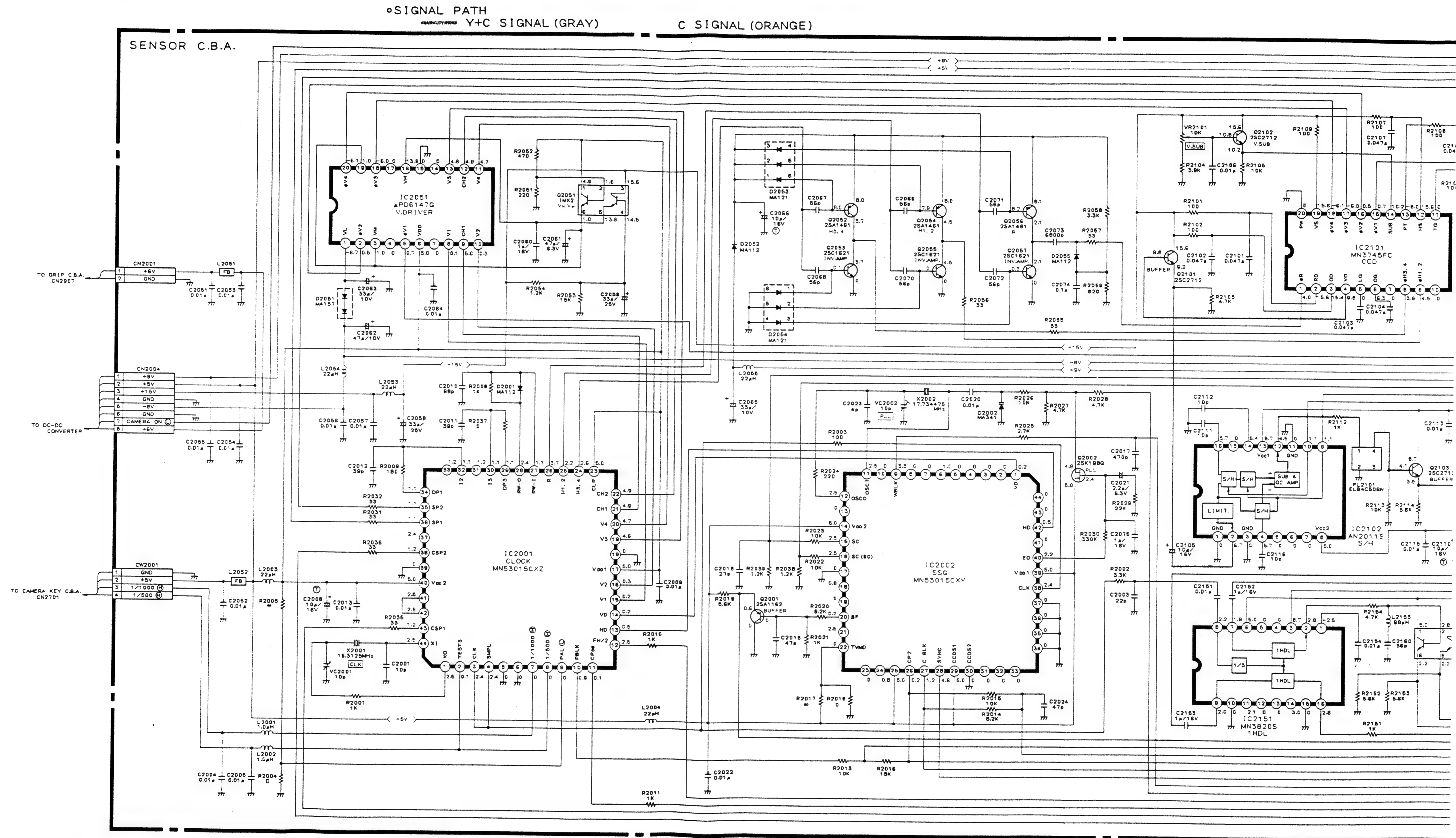


Note:
 ⊙: Denotes that it is connected to +5V pattern.
 ⊗: Denotes that it is connected to GND.
 (See "Guide to Diagrams" on the front page of this section.)

SIGNAL WAVE

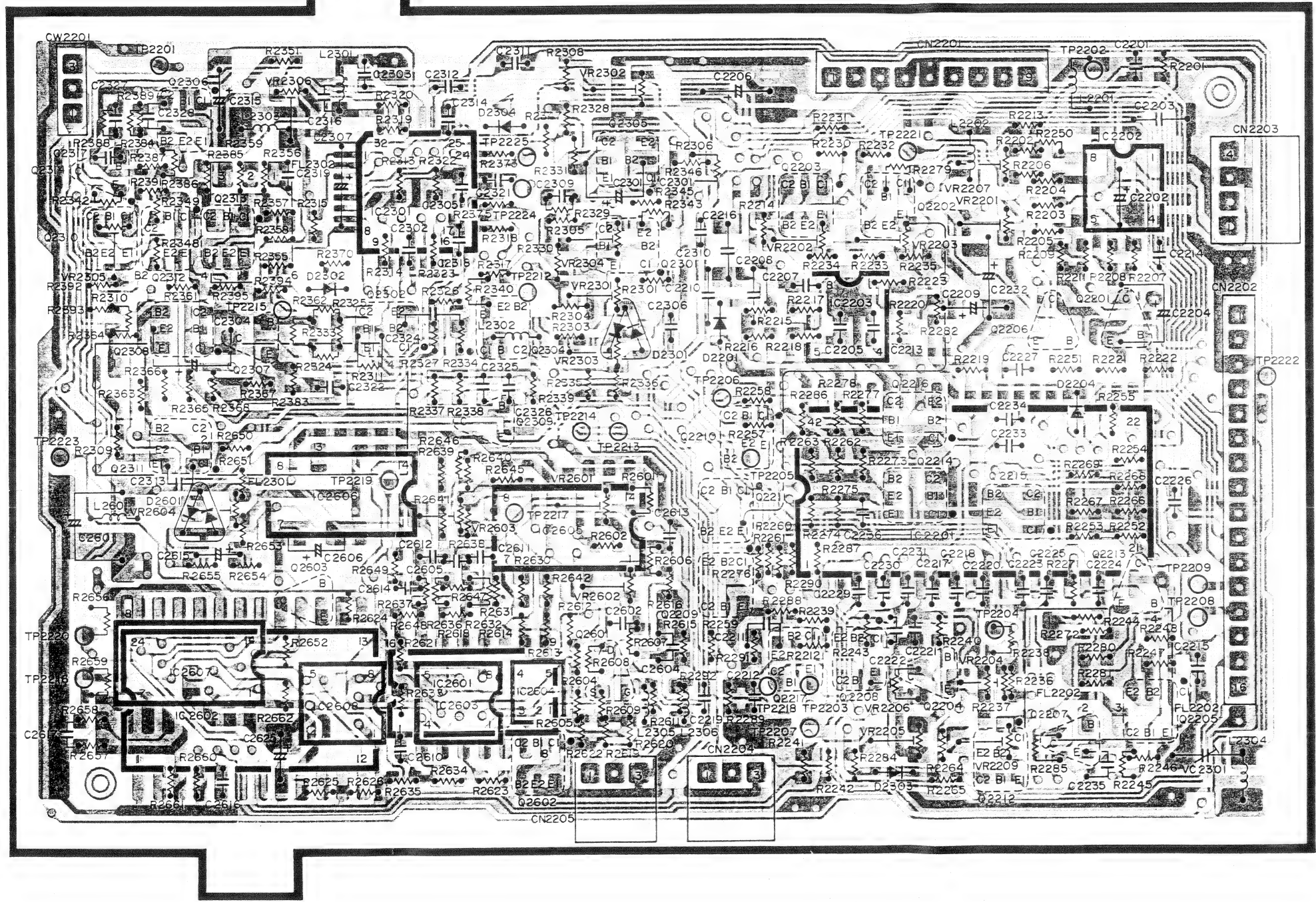


SCHEMATIC DIAGRAM SENSOR C.B.A.

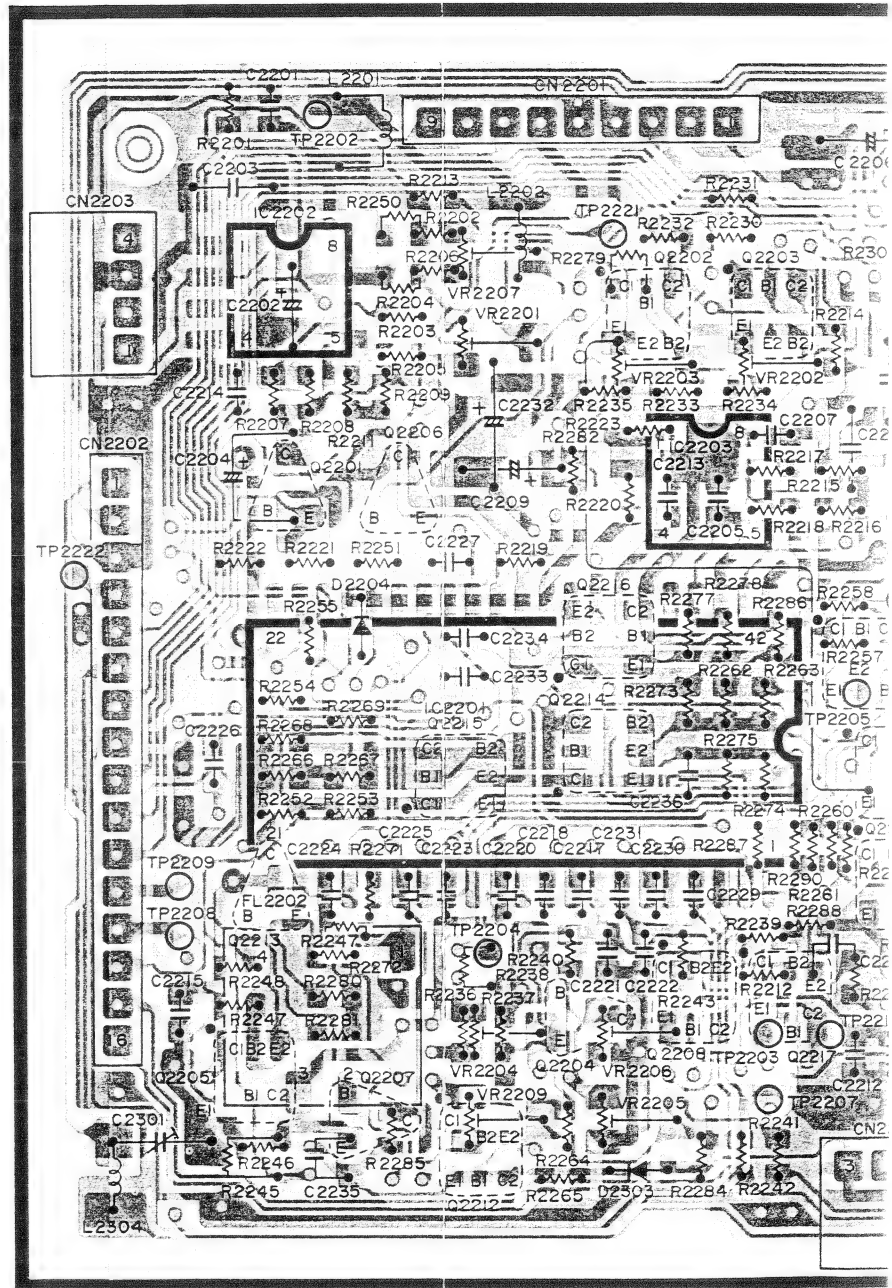


CIRCUIT BOARD DIAGRAM
PROCESS · CAMERA-KEY C.B.A.

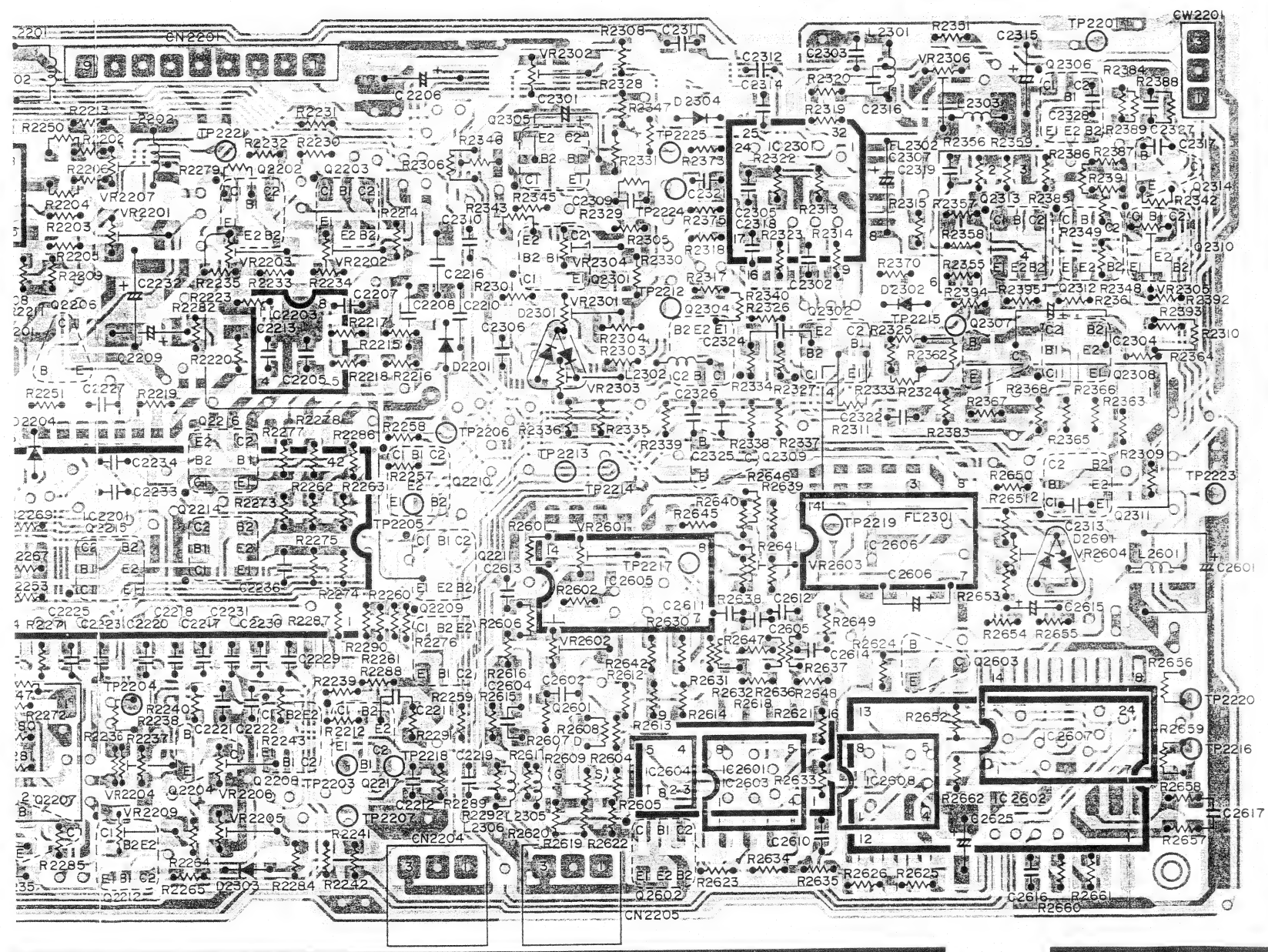
PROCESS C.B.A. (COMPONENT SIDE)



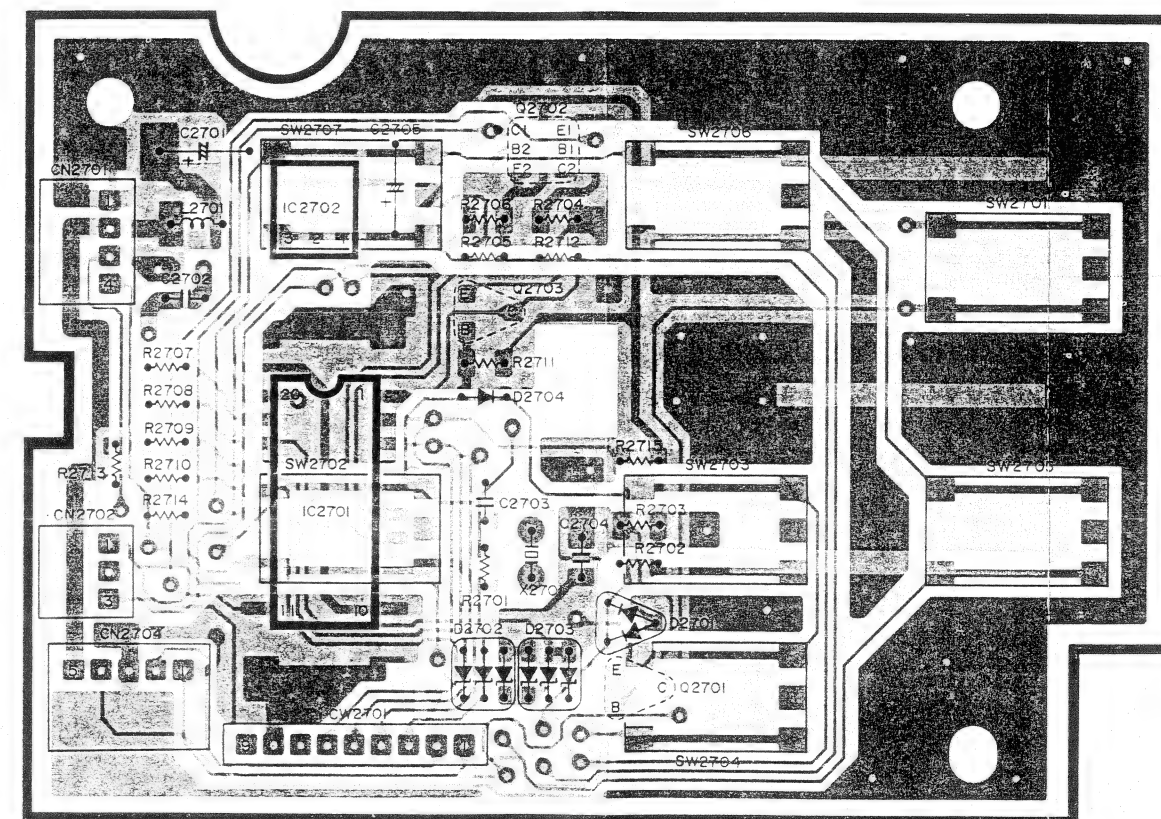
PROCESS C.B.A. (SOLDERING SIDE)



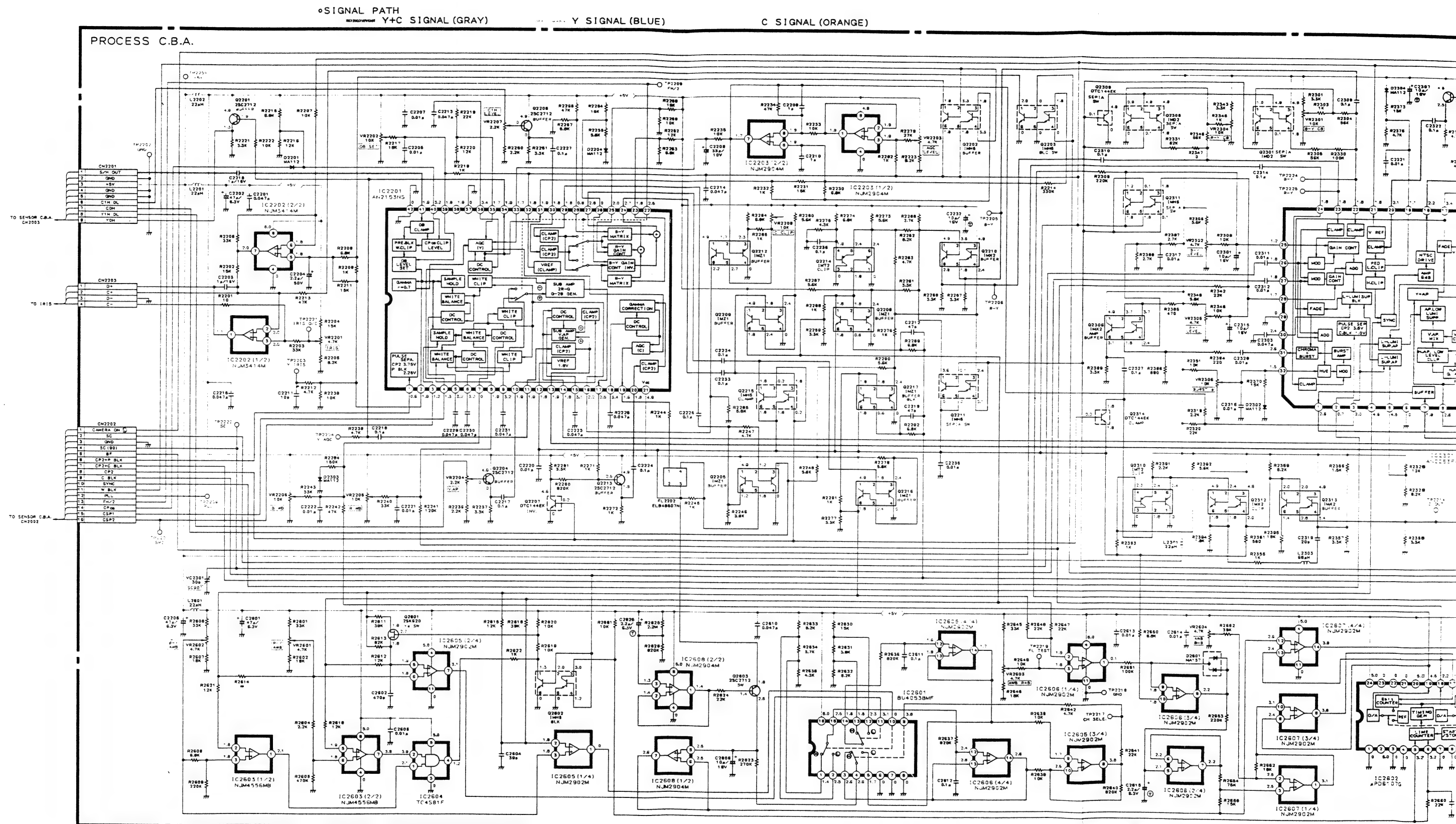
C.A. (SOLDERING SIDE)



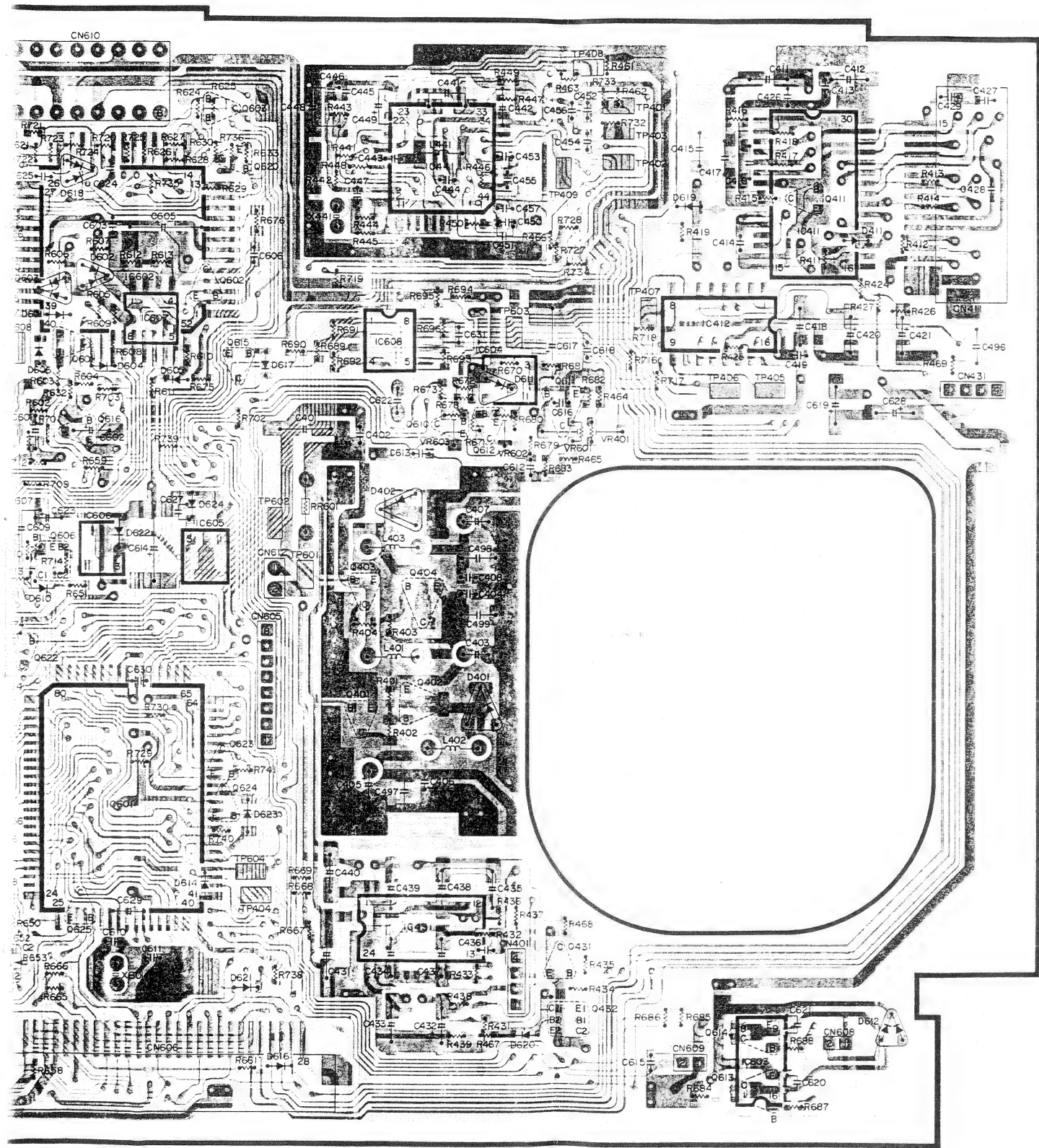
CAMERA-KEY C.B.A.



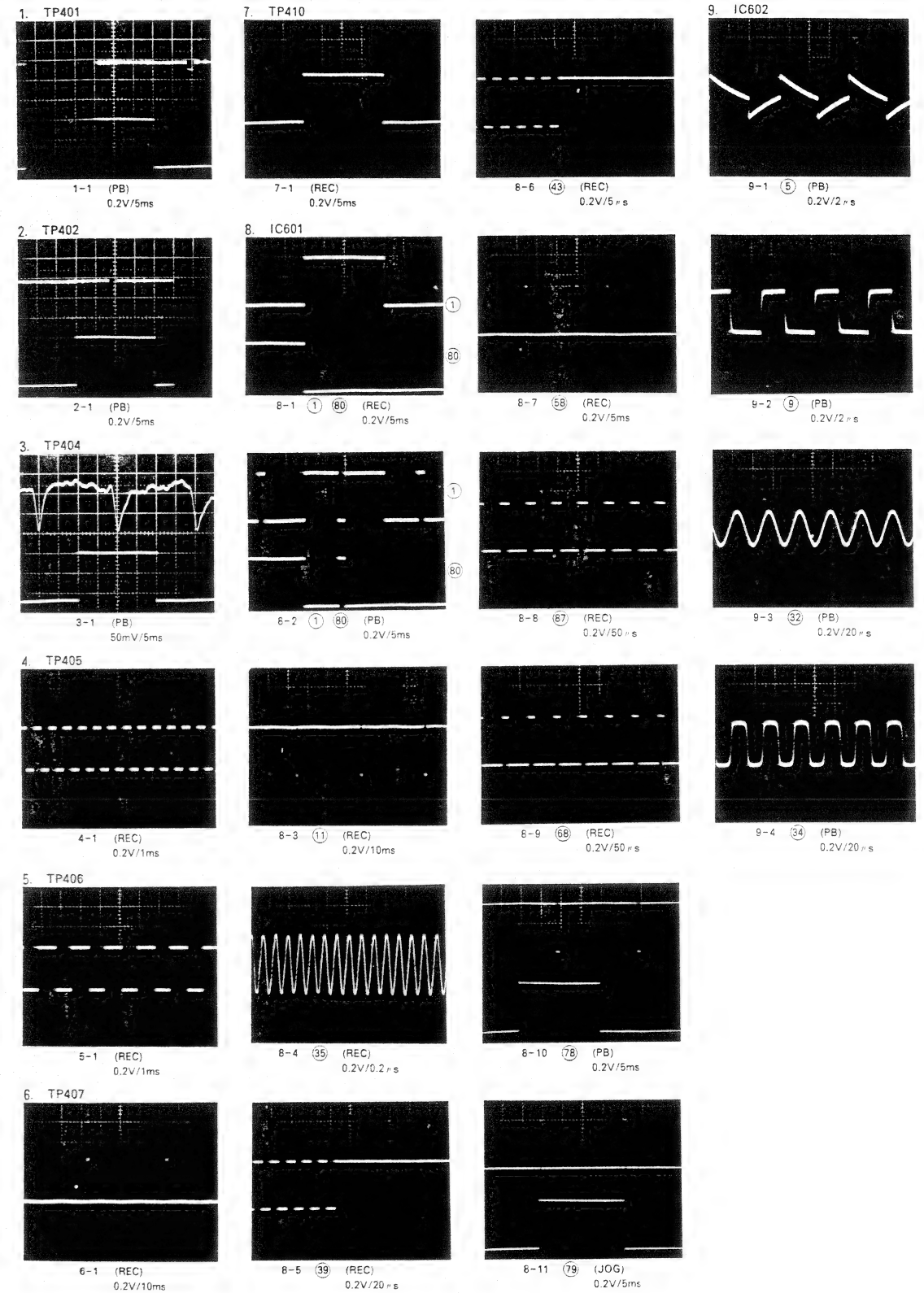
SCHEMATIC DIAGRAM
PROCESS • CAMERA-KEY C.B.A.



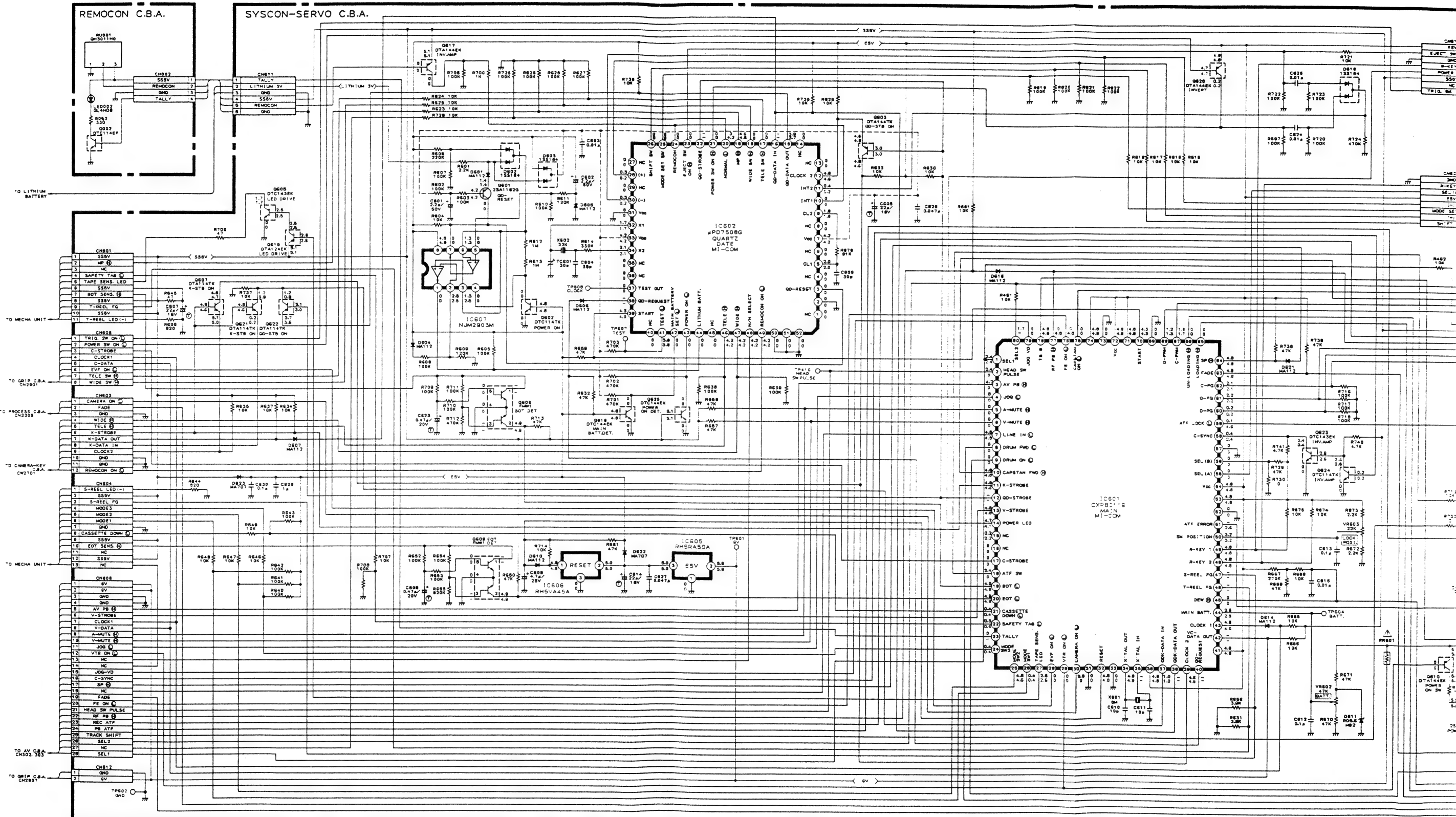
RD DIAGRAM IVO C.B.A.

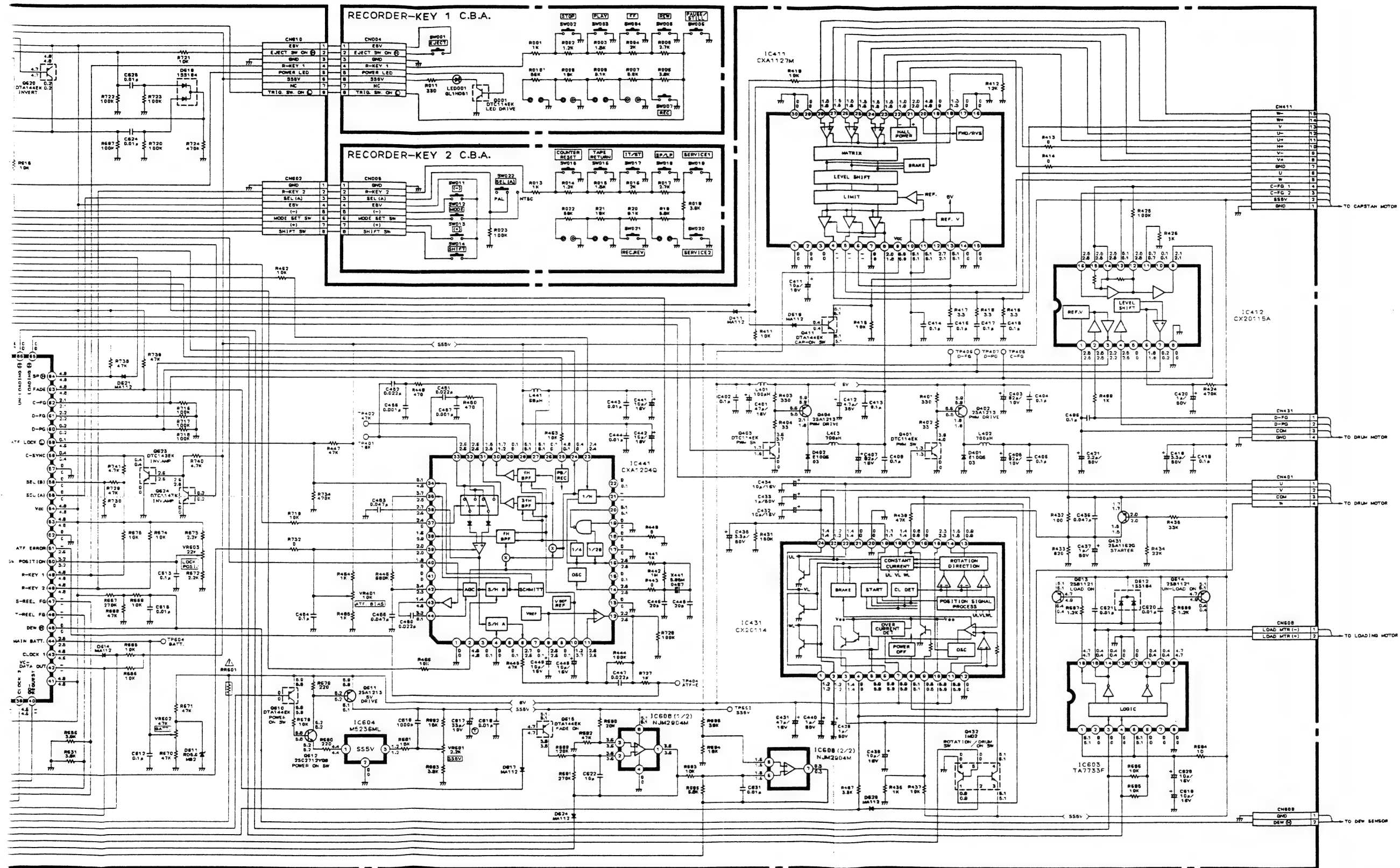


SIGNAL WAVE

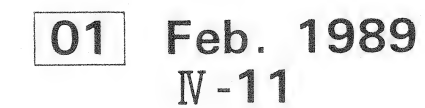


SCHEMATIC DIAGRAM SYSCON-SERVO C.B.A.

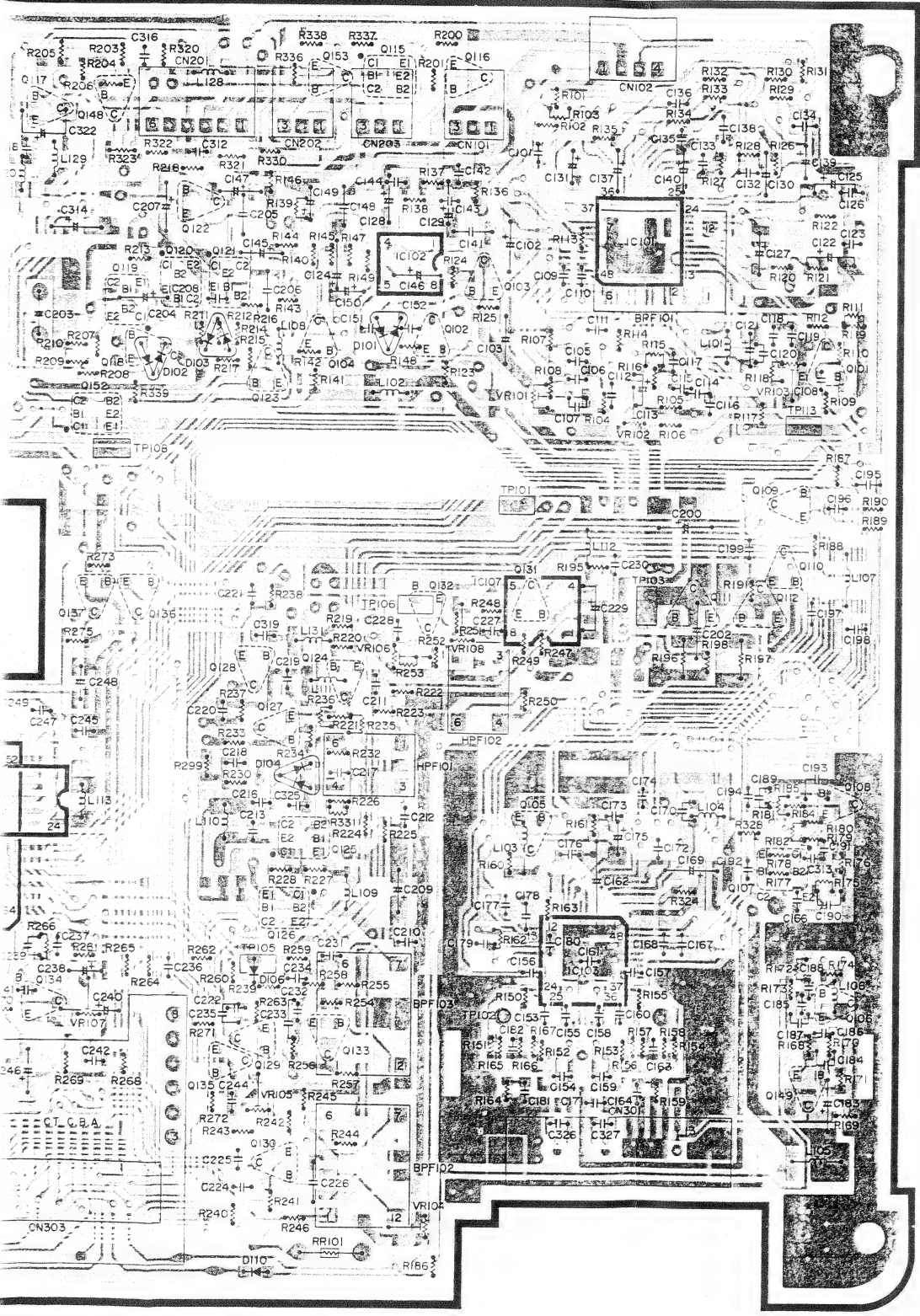




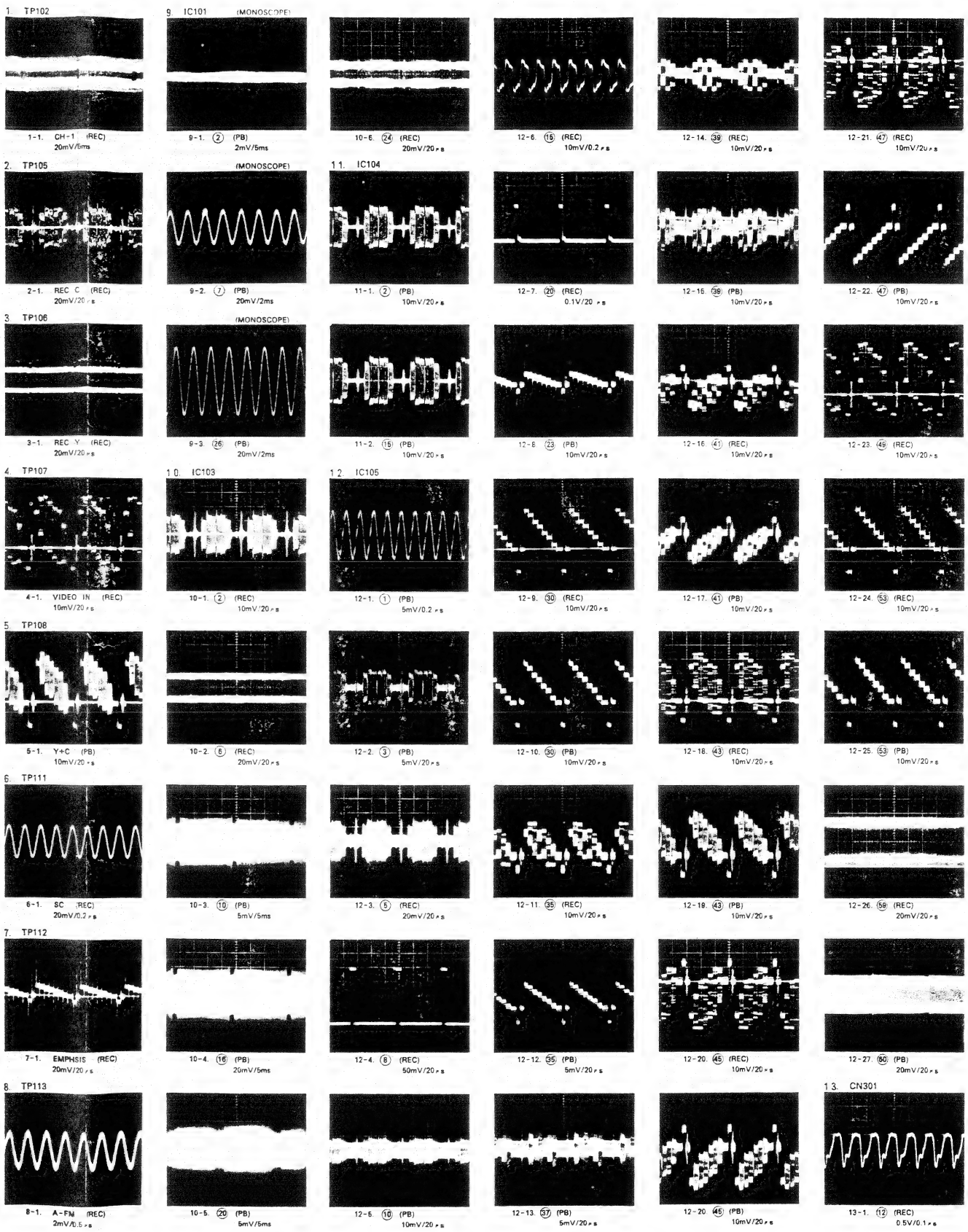
AUDIO-VIDEO C.B.A. (COMPONENT SIDE)



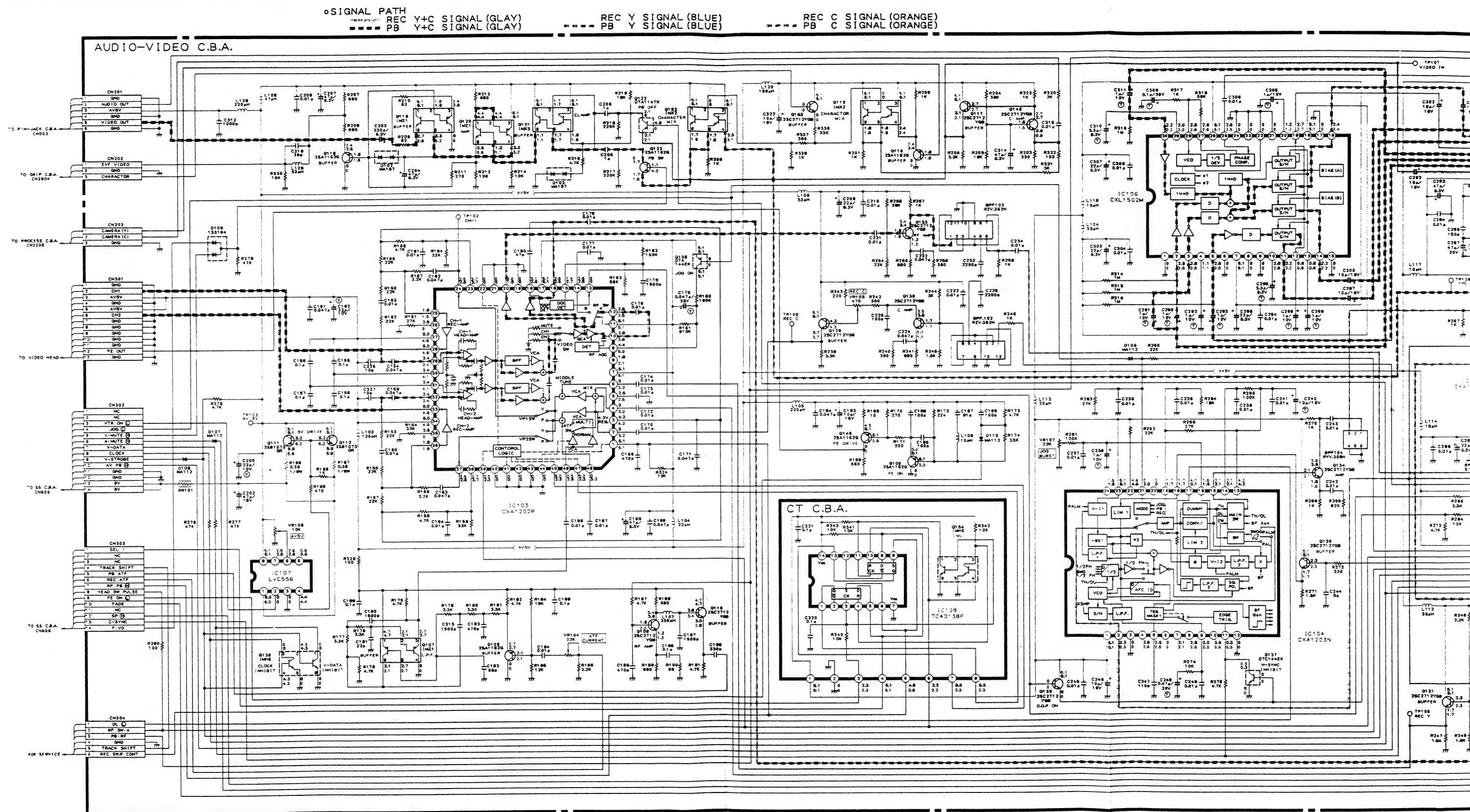
SOLDERING SIDE)

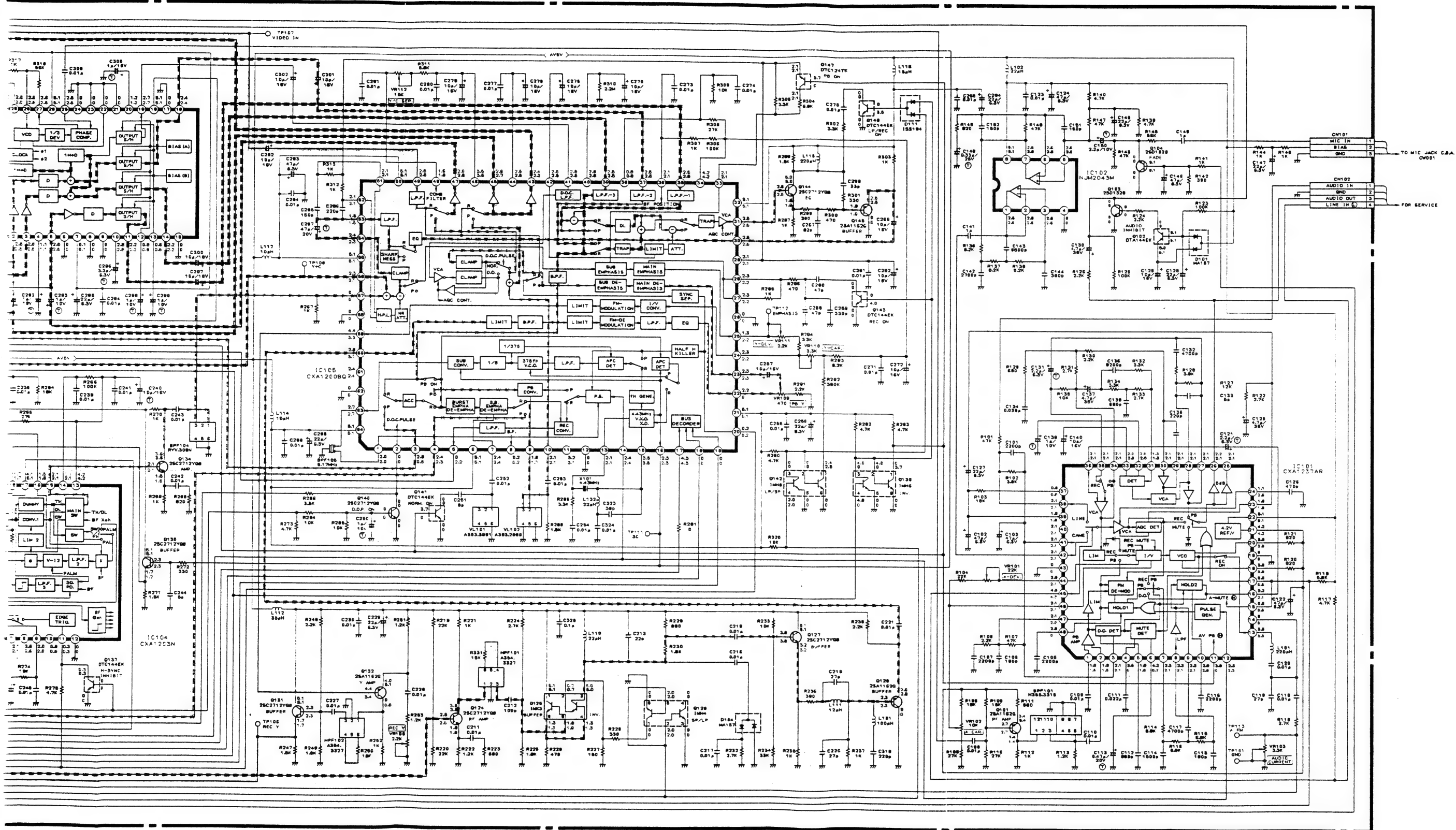


SIGNAL WAVE

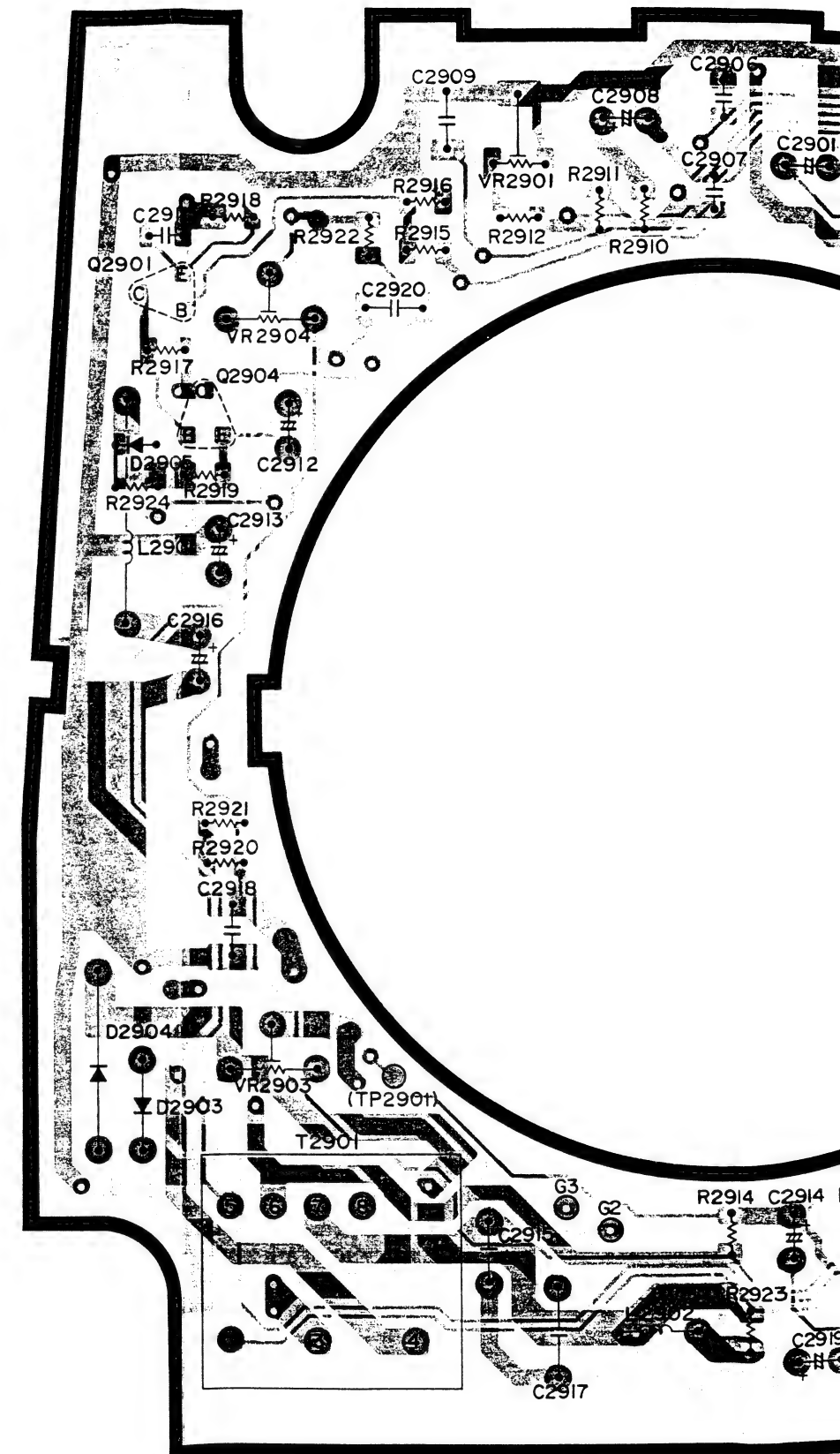


01 Feb. 1989

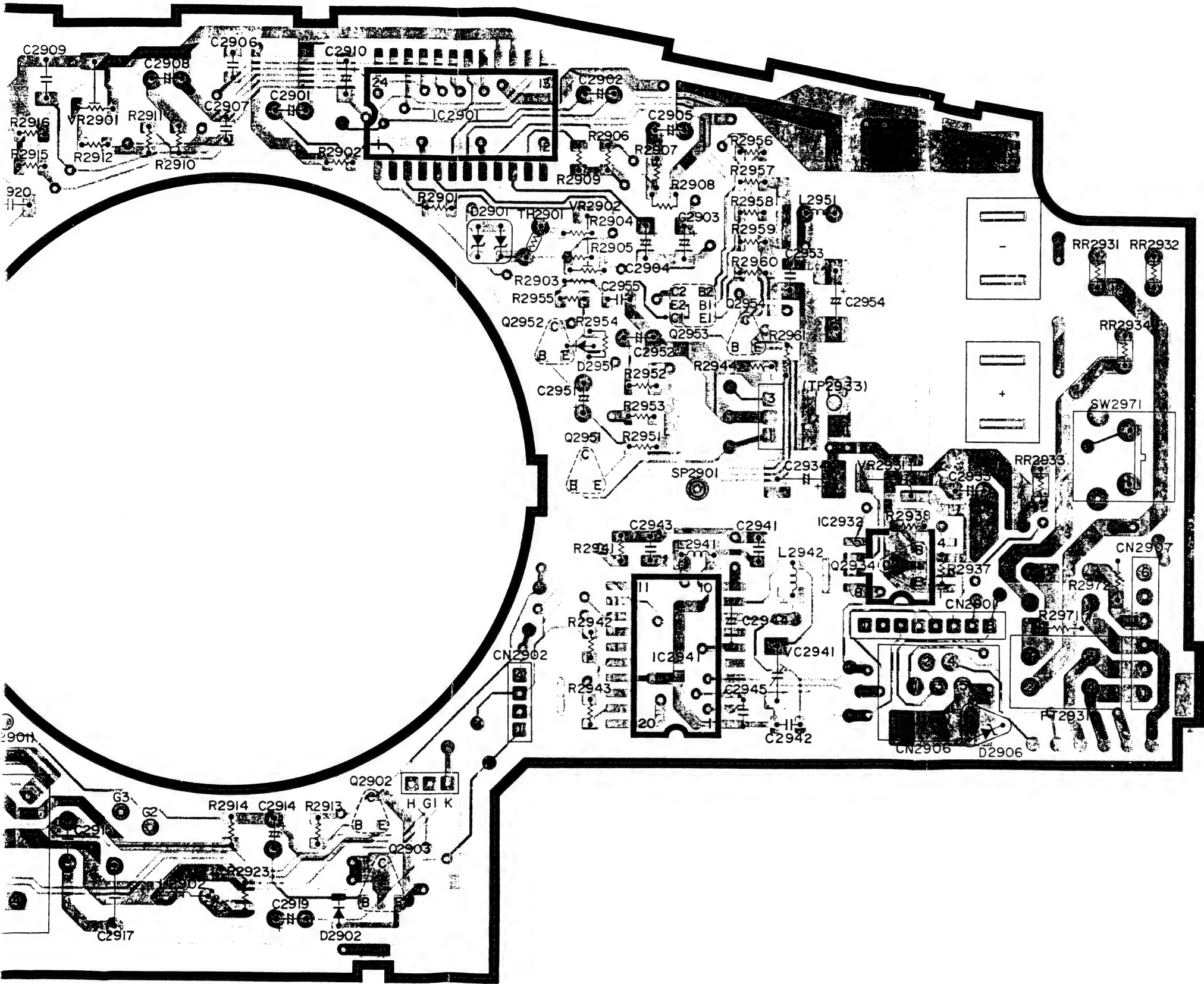




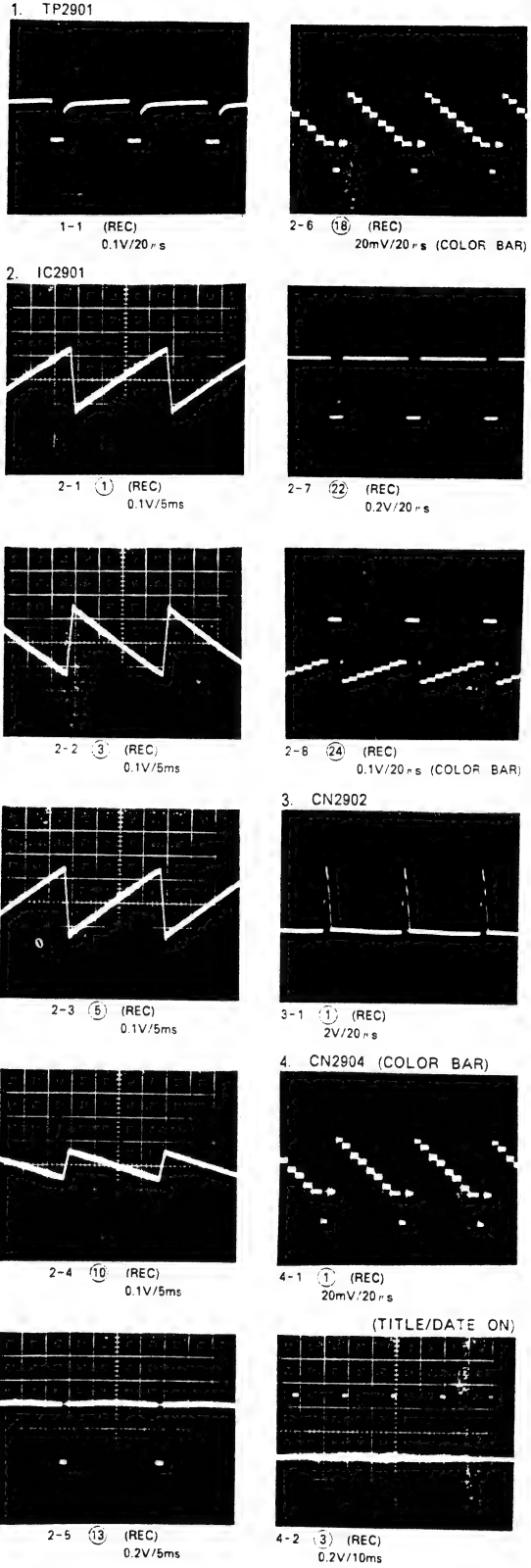
CIRCUIT BOARD DIAGRAM GRIP C.B.A.



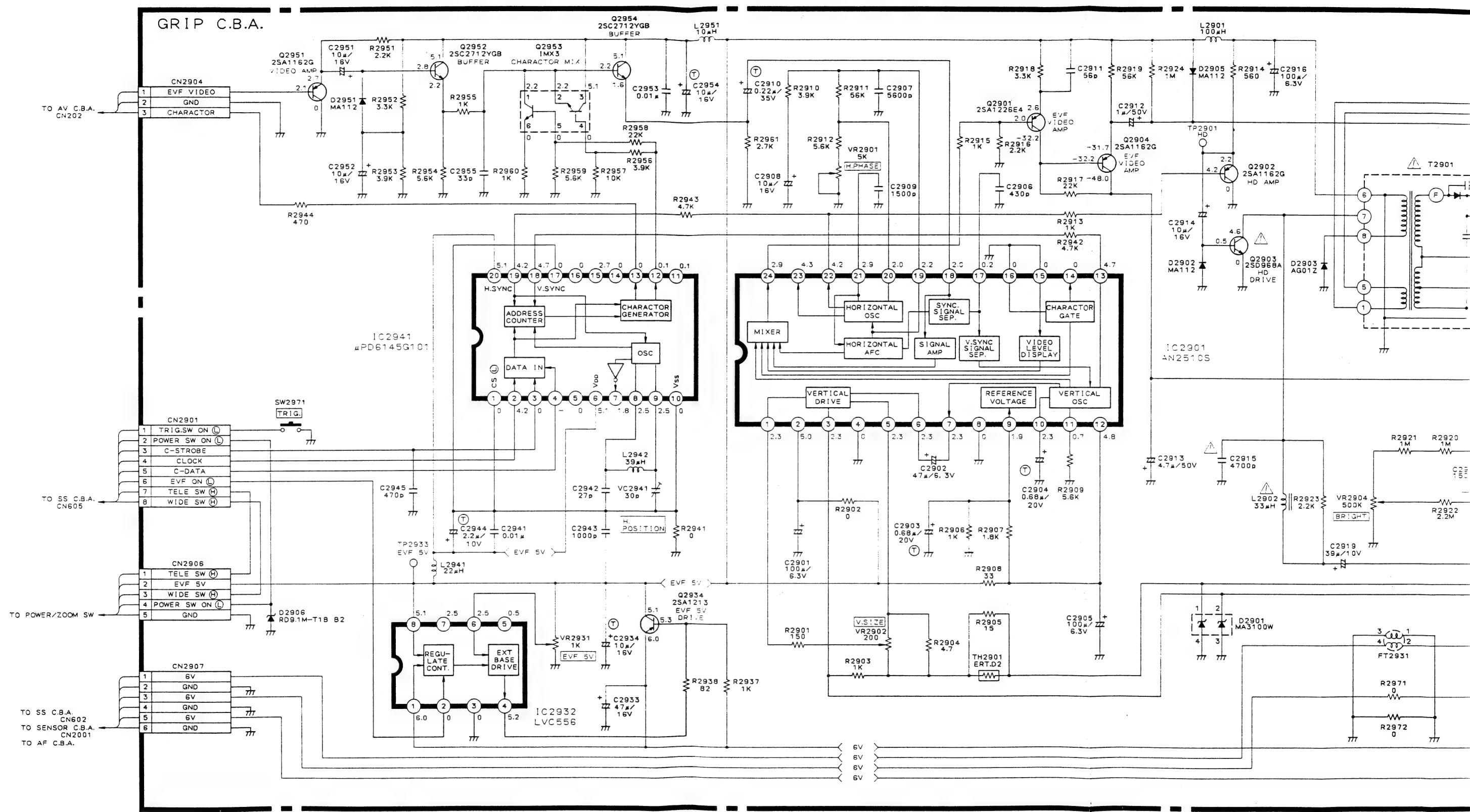
DIAGRAM



SIGNAL WAVE



SCHEMATIC DIAGRAM
GRIP C.B.A.



Supplement

During the production, some adjustments, part Nos., descriptions in the Service Manual were revised. The all revisions have been informed on the Service Manual Reports periodically, and this Supplement is composed of them.

SERVICE MANUAL REPORT INDEX

| SMR NO. | DATE | MODEL | NO. TITLE |
|-----------|--------|--------|---|
| AD-343P.S | '89. 3 | E80E/F | 1. Classification No. 2. Tool No. Correction (PII-1) 3. Parts Control Information |
| AD-347P.S | '89. 4 | E80E/F | 1. CCD Change 2. CCD Radiation Plate Elimination 3. Constant of Process C.B.A. Change (R2213) 4. Process C.B.A. Change 5. Top Cover Change 6. Constant of EVF C.B.A. Change 7. Audio Video C.B.A. Change 1 8. Audio Video C.B.A. Change 2 9. Adjustment Rating for ATF Recording Current Change 10. Constants of SS C.B.A. Change 11. Connector Change (Pin Jack C.B.A. ↔ Connector A'ssy. 6P) 12. Left Cover Change 13. Lens Rubber Ring Form Change 14. Screws Elimination (Recorder key 1, 2 C.B.A.S) 15. Service Manual Correction (SS C.B.A.) 16. IC601 (Main microcomputer) Change 17. Connector A'ssy. Change (Connector A'ssy. 2P) 18. Screw Size Change 19. Shield Tape Elimination 20. Finder Ass'y. Change 21. Parts Control Information |
| AD-351P.S | '89. 5 | E80E/F | 1. Right/Left Covers Change 2. Parts Control Information |
| AD-352P.S | '89. 6 | E80E/F | 1. Classification No. (IC601, AD-347 P.S) 2. Parts Control Information |

| SMR NO. | DATE | MODEL | NO. TITLE |
|-------------|--------|---------------------------|--|
| AD-359P | '89. 7 | E80E | 1. Shield Form Change (Audio Video C.B.A) 2. Rear Cover Form Change 3. Main Microcomputer IC601 (SS C.B.A. Change) 4. Parts Control Information |
| AD-359S | '89. 7 | E80F | 1. Shield Form Change (Audio Video C.B.A) |
| AD-371N.P.S | '89.11 | E80A/E/F | 1. Flexible Connector Addition (T/W Power Sw.) 2. Parts Control Information |
| AD-408N.P.S | '90. 7 | MC-4B | 1. Drive Gear Change 2. Parts Control Information |
| AD-416N.P.F | '90. 9 | E80A/E/F E808A/E/ F | 1. Part Change 2. Parts Control Information |
| AD-422N.P.F | '90. 9 | MC-4B MC-4C | 1. New Service Part Addition 2. Coaster, Right Change 3. Parts Control Information |
| AD-432P.F | '90.10 | MC-4B | 1. Remedy for Reel Motor Error |
| AD-441N.P.F | '90.11 | MC-4B | 1. New Service Parts 2. Parts Control Information |

Canon VIDEO SERVICE
©
MANUAL REPORT
Technical Service Department, Canon Inc

Report No. AD-343P-S 1/2

Date March 20, 1989

Canon E80E/F

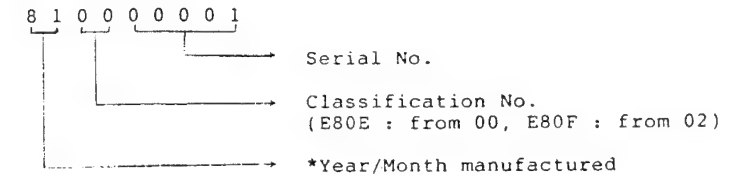
PAL

SECAM

1. Classification No.
2. Tool No. Correction (PII-1)
3. Parts Control Information

1. Classification No.

The classification No. of the product mentioned in the title are stamped as follows.



*

| Month Year | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---------------|----|----|----|----|-----|-----|-----|----|----|----|----|----|
| 89 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 |
| 90 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 |
| 91 | 21 | 22 | 23 | 24 | --- | --- | --- | | | | | |
| ... | | | | | | | | | | | | |

2. Tool No. Correction (PII-1)

2-1 Correction

The following description on the table of maintenance tools list (PII-1) is corrected as follows.

Error

Corrected

DY9-2039-000 115 → DY9-2039-500 220 (for 220V)
→ DY9-2039-500 240 (for 240V)

*Remarks : The above corrected tools are established as new service tools.

In details, refer to Service Tools Report (DTR- 045E)
issued at the end of March 1989.

3. Parts Control Information :

Changed, Deleted and New service parts : N/A

Canon VIDEO SERVICE MANUAL REPORT

Technical Service Department, Canon Inc.

Report No. AD-347P·S 1/13

Date April 20, 1989

Canon E80E/F

1. CCD Change
2. CCD Radiation Plate Elimination
3. Constant of Process C.B.A. Change (R2213)
4. Process C.B.A. Change
5. Top Cover Change
6. Constant of EVF C.B.A. Change
7. Audio Video C.B.A. Change 1
8. Audio Video C.B.A. Change 2
9. Adjustment Rating for ATF Recording Current Change
10. Constants of SS C.B.A. Change
11. Connector Change (Pin Jack C.B.A. ↔ Connector A'ssy. 6P)
12. Left Cover Change
13. Lens Rubber Ring Form Change
14. Screws Elimination (Recorder key 1, 2 C.B.A.s)
15. Service Manual Correction (SS C.B.A.)
16. IC601 (Main microcomputer) Change
17. Connector A'ssy. Change (Connector A'ssy. 2P)
18. Screw Size Change
19. Shield Tape Elimination
20. Finder Ass'y. Change
21. Parts Control Information

PAL

SECAM

1. CCD Change

1-1 Change

To reduce the unevenness of dark current, CCD (DH4-0206-000) has been changed.

(With this change, CCD radiation plate is eliminated, etc.. Refer to the following No. 2 through No. 4 for details.)

1-2 Classification : Changed from 05

1-3 Interchangeability : Possible

1-4 Repair Information :

1. When replacing the old type CCD with the new type, change the constant of R2213 on Process C.B.A.s. (refer to item No.3)
2. The new CCD(DH4-0206-000) only is stocked.
3. Perform the following check after the replacement of CCD regardless of its classification No.
 - 1) Shoot the white chart (5600°K), and lock AWB.
 - 2) Shoot the colorbar chart with the standard angle of view.
 - 3) By pushing the BLC switch, check the saturation level of chrominance component. (Yellow, Cyan: saturation acceptable
Magenta: slightly light color acceptable, Others: normal color accepted)
 - 4) If the above specification are not obtained, perform the blooming adjustment again. At this time, set the V. SUB voltage a little bit lower. (blooming remained a little)

2. CCD Radiation Plate Elimination

2-1. Elimination

With the CCD change above, the CCD radiation plate is eliminated.

(Screw XA1-7200-357 is also eliminated.)

2-2 Classification : Changed during 05

2-3 Interchangeability : Possible

2-4 Repair Information :

For the new type CCD, the radiation plate is not required.

3. Constant of Process C.B.A. Change (R2213)

3-1 Change

For more accurate back light compensation adjustment, the constant of R2213 is changed as follows.

| | Old | New |
|-------|---------------|----------------------------------|
| R2213 | 47 k Ω | 68 k Ω (VR5-7750-683 000) |

The new (revised R2213 installed) Process C.B.A. (DG1-0534-000) only is stocked.

3-2 Classification : Changed during 05

3-3 Interchangeability : Possible (refer to the next item.)

3-4 Repair Information :

When replacing the old type CCD with the new type, change the constant of R2213.

4. Process C.B.A. Change

4-1 Change

With the change of CCD, R2319, 2324 and 2328 are eliminated (color suppression at low illumination is released). The new process C.B.A. (the above resistors eliminated) only is stocked. (DG1-0534-000)

4-2 Classification : Changed during 05

4-3 Interchangeability : Possible

4-4 Repair Information :

When replacing the process C.B.A. installed on the old type CCD (before the classification No. 05, 05 not included.) With the new type process C.B.A., install R2319, 2324 and 2328.

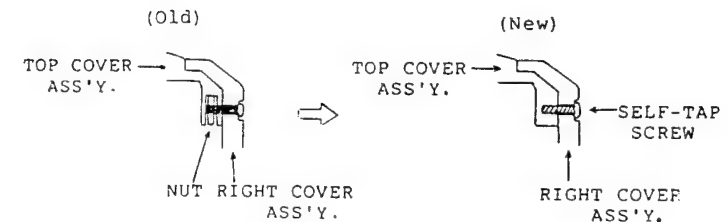
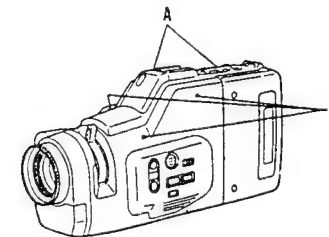
R2319 (VR5-7750-201) R2324, 2328 (VR5-7750-103) are stocked as service parts.

5. Top Cover Change

5-1 Change

For cost efficiency, screws which secure the top cover and the right/left covers have been changed.

With this change, the form of top cover is changed, and also, the plate nuts are deleted.



Sectional View of Screw Parts

Old New

| | | |
|------------|----------------------|---|
| Screws (A) | XA1-7200-359 (× 2) | } XA9-0449-000 (× 5) (Self-tap type) |
| Screws (B) | XA1-7200-459 (× 3) | |

5-2 Classification : Changed after 06.

5-3 Repair Information :

- 1) The new top cover A'ssy. (E80E : DY2-1087-000, E80F : DY2-1088-000) only are stocked.
- 2) When replacing the old type top cover with the new type, replace the screw with XA9-0449-000.

6. Constant of EVF C.B.A. Change

6-1 Change

To stabilize the vertical oscillation in EVF, the constant is changed as follows.

| Old | New |
|-----|-----|
|-----|-----|

| | |
|-------|--|
| R2909 | 5.6 k Ω \rightarrow 6.8 k Ω (VR5-2770-682) |
|-------|--|

6-2 Classification : Changed from 01.

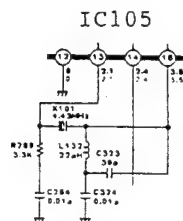
6-3 Interchangeability : Possible

The new EVF C.B.A. (DG1-0550-000) only is stocked.

7. Audio Video C.B.A. Change 1

7-1 Change

To prevent no color reproduction in recording at low temperatures, C323, 325 and L132 are eliminated.



C323, C324 L132 eliminated
(open)

7-2 Classification : Changed from 02

7-3 Interchangeability : Possible

The new Audio Video C.B.A. (DG1-0530-000) only is stocked.

8. Audio Video C.B.A. Change 2

8-1 Change

To lengthen the adjustment range of Playback Luminance Level Adjustment, VR109 (PB Y) is changed as follows.

| Old | New |
|-----|-----|
|-----|-----|

| | |
|-----------------------------------|---|
| VR109 470 Ω (VR5-7780-471) | \rightarrow 1 k Ω (VR5-7780-102) |
|-----------------------------------|---|

8-2 Classification : Changed from 02

8-3 Interchangeability : Possible

The new Audio Video C.B.A. (DG1-0530-000) only is stocked.

9. Adjustment Rating for ATF Recording Current Change

9-1 Change

To remove a loss of vertical synchronization when playing back the tape recorded in interval recording mode, the rating for ATF current adjustment is revised. (On the service manual, the rating had been already revised.)

9-2 Classification : Changed from 03

9-3 Repair Information :

When repairing the equipment with the above symptom (before 03), adjust the ATF current with the revised rating specified on the manual.

10. Constants of SS C.B.A. Change

10-1 Change

As the reel sensor was changed (because of the manufacturing maker was changed), the following constants are revised.

| | Old | New |
|------|---|-----|
| R631 | 3.9 k Ω \rightarrow 1.8 k Ω | |
| R656 | 3.9 k Ω \rightarrow 1.8 k Ω | |
| R699 | 820 Ω \rightarrow 560 Ω | |
| R644 | 820 Ω \rightarrow 560 Ω | |

10-2 Classification : N/A

10-3 Interchangeability : Possible

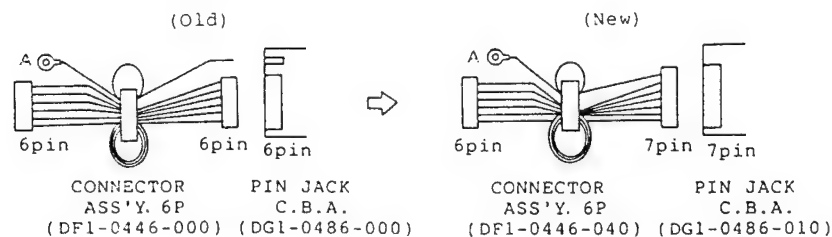
10-4 Repair Information :

The new Type SS C.B.A. (DG1-0529-000) only is stocked.

11. Connector Change (Pin Jack C.B.A. Connector A'ssy. 6P)

11-1 Change

For repairing efficiency, the forms of the Pin Jack C.B.A. and the connector A'ssy. 6P are changed as follows.



11-2 Classification : Changed (informed later)

11-3 Interchangeability :

| CONNECTOR ASS'Y. 6P | Old | New |
|---------------------|--------------|--------------|
| PIN JACK C.B.A. | DF1-0446-000 | DF1-0446-040 |
| Old DG1-0486-000 | OK | NG |
| New DG1-0486-010 | NG | OK |

11-4 Repair Information :

- As the new and old type Connector A'ssy.s and Pin Jack C.B.A.s are not interchangeable, the both types are stocked.
- Remove the earth wire ("A" in the Fig.) as it is not necessary.

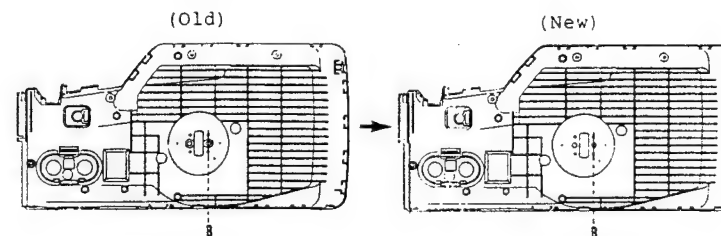
12. Left Cover Change

12-1 Change

To strengthen a grip screw part of the left cover, a supporting plate (Fig. B) is added.

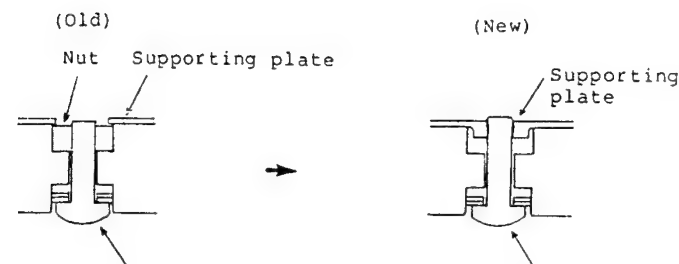
(This supporting plate is not established as a service part.)

* With this addition, the nut is deleted. Fig. A·B



Left Cover A'ssy (DY2-1101-000)

Fig. A



Screw (XB1-1300-809)

Screw (XB1-1300-957)

Fig. B Sectional View of Screw Part

Also, the number of screws for the left cover is changed from four to two. Fig. C

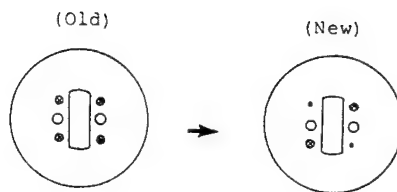


Fig. C

12-2 Classification : Changed after 06.

12-3 Interchangeability :

| Left cover Ass'y. | Old | New DY2-1101-000 |
|-------------------|-----|---------------------|
| Screw | | |
| Old XB1-1300-809 | OK | NG |
| New XB1-1300-957 | OK | OK |

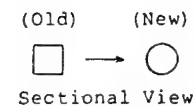
12-4 Repair Information :

- 1) When replacing the old type left cover assembly with the new type, use XB1-1300-957.
- 2) After the replacement, apply Screw Lock 1401B (CY9-1082-000) on contacting surface between the screws and the supporting plate.

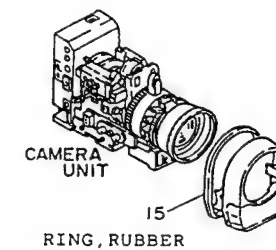
13. Lens Rubber Ring Form Change

13-1 Change

For repairing efficiency, a form of lens rubber ring (DA1-1835-000) is changed as shown below.



Sectional View



13-2 Classification : N/A

13-3 Interchangeability : Possible

13-4 Repair Information :

The new type only is stocked after the old stock depletion.

14. Screw Elimination (Recorder Key 1, 2 C.B.A.s)

14-1 Elimination

For cost efficiency, the screws (XA1-7200-357) of Recorder key 1, 2 C.B.A.s are eliminated.

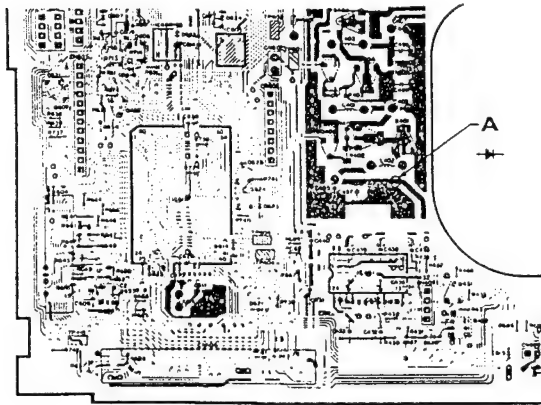
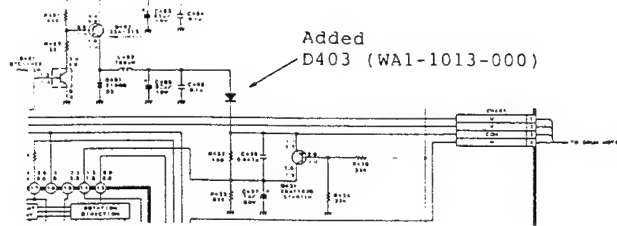
14-2 Classification : N/A

15. Service Manual Correction

15-1 Correction

Add the following diode (D403 : WA1-1013-000) to the position indicated in the figure below.

SS C.B.A.



* The part of pattern ("A" in the Fig.) is cut for D403 installation.

Also, the land for D403 is added on the pattern.

16. IC601 (Main microcomputer) Change

16-1 Change

The software of IC601 (SS C.B.A.) has been changed. (from the third to the fifth via the fourth)

With this revision, D403 is eliminated, and the chip jumper wire is added instead.

16-2 Classification : Changed (informed later.)

16-3 Repair Information :

- 1) As the service parts, the fifth IC601 (DH4-0204-000) and the SS C.B.A. where the fifth IC601 mounted (DGI-0529-000) only are stocked.
- 2) Even after replacing the IC601, D403 is not necessary to be removed.

17. Connector Ass'y. Change (Connector A'ssy. 2P)

17-1 Change

For repairing efficiency, the length of connector A'ssy. (CN4006, DH2-0962-000) is changed from 80 to 40 mm.



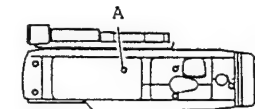
17-2 Classification : N/A

17-3 Interchangeability : Possible

18. Screw Size Change

18-1 Change

To protect wire of recorder key C.B.A. from damaging by a screw point, the length of screw ("A" in the Fig. below) has been shortened.



Old

New

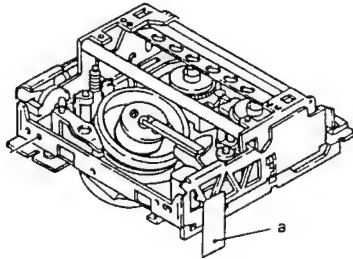
XA1-7200-359 → XA1-7200-309

18-2 Classification : N/A

19. Shield Tape Elimination

19-1 Elimination

For cost efficiency, a shield tape ("a" in the Fig. below) has been eliminated.



19-2 Classification : N/A

19-3 Repair Information

The shield tape is not established as a service part.

20. Finder A'ssy. Change

20-1 Change

To rotate a diopter adjustment ring more smoothly, the form is modified.

20-2 Classification : N/A

20-3 Interchangeability : Possible

20-4 Repair Information

For the service parts of unmodified, paraffine is applied.

21. Parts Control Information

21-2 Deleted parts : N/A

21-3 Changed parts :

| | |
|--------------|--|
| DA1-1835-000 | Deleted after old stock depleted. |
| DH2-0962-000 | New only stocked after old stock depletion. |
| DH4-0204-000 | New only stocked. |
| DH4-0206-000 | New only stocked. |
| DG1-0529-000 | New only stocked. |
| DG1-0530-000 | New only stocked. |
| DG1-0534-000 | New only stocked. |
| DG1-0550-000 | New only stocked. |
| DY2-1087-000 | New only stocked. |
| DY2-1088-000 | New only stocked. |
| VR5-2770-682 | Added to Parts List. |
| VR5-7750-103 | Added to Parts List. |
| VR5-7750-222 | Added to Parts List. |
| VR5-7780-102 | Added to Parts List. |
| VR5-7780-471 | Q'ty. changed from 2 to 1. |
| XA1-7200-309 | Added to Parts List. |
| XA1-7200-357 | Q'ty. changed from 12 to 9. |
| XA1-7200-359 | Q'ty. changed from 3 to 0. (Stocked as usual). |
| XA1-7200-459 | Q'ty. changed from 13 to 10. |
| XB1-1300-809 | Deleted after old stock depleted. |
| DY2-1101-000 | New only is stocked. |

21-3 New Service Parts :

| PART NO. | CLASS | Q'TY. | DESCRIPTION |
|------------------|-------|-------|-------------------------|
| DF1-0446-040 000 | C | 1 | CONNECTOR ASS'Y. 6P |
| DG1-0486-010 000 | C | 1 | PIN JACK C.B.A. |
| VR5-7750-683 000 | C | 1 | RESISTOR 68 kΩ |
| XA9-0449-000 000 | F | 5 | SCREW, CROSS-RECESS, PH |
| XB1-1300-957 000 | F | 2 | SCREW |

Canon E80E/F

1. Right/Left Covers Change
2. Parts Control Information

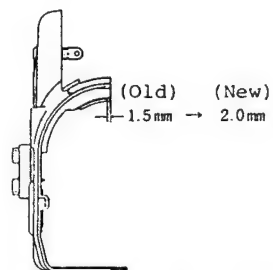
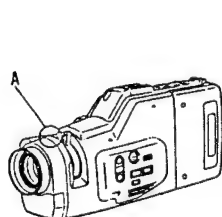
PAL

SECAM

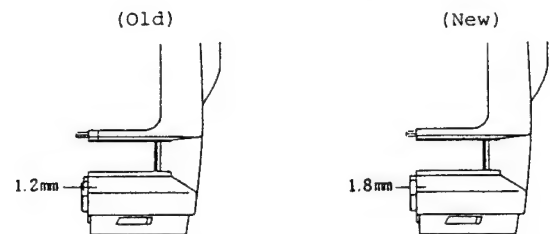
1. Right/Left Covers Change

1-1 Change

To strengthen matching surfaces ("A" in the figure) of Right/Left covers, each forms are changed as follows.



Left cover (DY2-1101-000)



Right cover (E80E DY2-1089-000)
 (E80F DY2-1090-000)

1-2 Classification: Not changed (Changed during 06)

1-3 Interchangeability

| Right cover \ Left cover | Old | New |
|--------------------------|-----|-----|
| | Old | New |
| Old | o | o |
| New | x | o |

o: Interchangeable
 x: Not interchangeable

1-4 Repair Information

The new Right/Left covers only are stocked.
 The new right cover can be used with the old left cover by cutting "A" part as specified.

2. Parts Control Information

2-1 Deleted parts: N/A

2-2 Changed parts: DY2-1089-000 New only stocked.
 DY2-1090-000 New only stocked.
 DY2-1101-000 New only stocked.

2-3 New Service Parts: N/A

Canon VIDEO SERVICE MANUAL REPORT

Technical Service Department, Canon Inc.

Report No. AD-352P-S 1/1

Date June 20, 1989

Canon E80E/F

1. Classification No. (IC601, AD-347P-S)
2. Parts Control Information

PAL

SECAM

1. Classification No. (IC601)

The classification No. for the IC601 (Main microcomputer, AD-347P-S No. 16) has been changed as follows:

- Classification No.: Changed from 07.

2. Parts Control Information

- 2-1 Deleted parts : N/A
- 2-2 Changed parts : N/A
- 2-3 New Service Parts : N/A

Canon VIDEO SERVICE MANUAL REPORT

Technical Service Department, Canon Inc.

Report No. AD-359P 1/2

Date July 20, 1989

Canon E80E

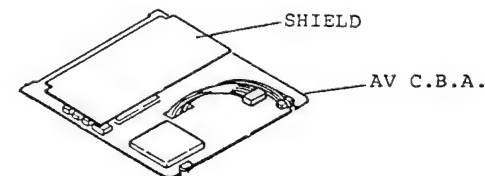
1. Shield Form Change (Audio Video C.B.A.)
2. Rear Cover Form Change
3. Main Microcomputer IC601 (SS C.B.A. Change)
4. Parts Control Information

PAL

1. Shield Form Change (Audio Video C.B.A.)

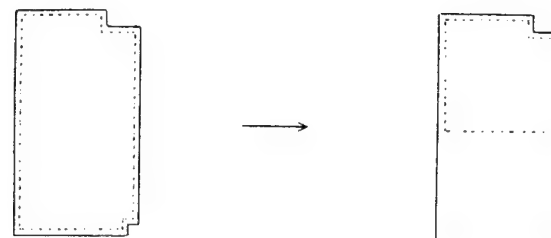
1-1 Change

A shield form of Audio Video C.B.A. has been changed as follows.



(Old)

(New)



----- Copper sheet
——— Polyester sheet

1-2 Classification : Changed from 05.

1-3 Interchangeability : Possible

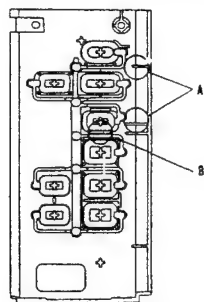
1-4 Repair Information : The shield is not established as a service part.

2. Rear Cover Form Change

2-1 Change

To prevent a rear cover from getting onto the R-KEY2 C.B.A. by shock, height of ribs (A and B in the figure below) are changed as follows.

The new Rear Cover Ass'y. (DY2-1091-000) only are stocked.



(New)

A +2mm

B -2.5mm

Rear Cover Ass'y.
(DY2-1091-000)

2-2 Classification : Changed from 1108.

2-3 Interchangeability : Possible

3. Main Microcomputer IC601 Change (SS C.B.A.)

3-1 Change

To correct an auto date character display (ARP.→APR.), the software of the main microcomputer IC601 (SS C.B.A.) has been changed from the fifth to the sixth.

| | | |
|---------------|---|---------------|
| 5th | | 6th |
| CXP80116-139Q | → | CXP80116-155Q |

3-2 Classification : Changed from 1110.

3-3 Interchangeability : Possible

When the IC601 is changed from the third or fourth to the sixth, the jitter performance in interchangeability and self-recording are improved, however, the jitter performance of playback picture recorded with the third or fourth IC601 is deteriorated when playbacked with the sixth.

3-4 Repair Information

As the service parts, IC601 (DH4-0204-000) and SS C.B.A. (DGL-0529-000) where the sixth IC601 mounted only are stocked.

4. Parts Control Information :

4-1 Deleted, Changed, New Service Parts : N/A

Canon VIDEO SERVICE MANUAL REPORT

Technical Service Department, Canon Inc.

Report No. AD-359S 1/1

Date July 20, 1989

Canon E80F

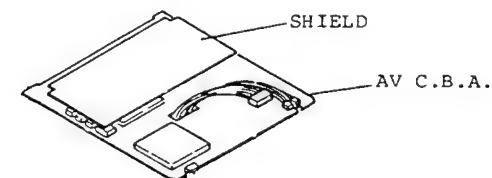
1. Shield Form Change (Audio Video C.B.A.)

SECAM

1. Shield Form Change (Audio Video C.B.A.)

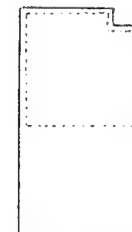
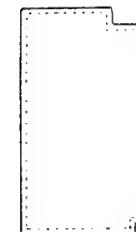
1-1 Change

A shield form of Audio Video C.B.A. has been changed as follows.



(Old)

(New)



----- Copper sheet
——— Polyester sheet

1-2 Classification : Changed from 1105.

1-3 Interchangeability : Possible

1-4 Repair Information :

The shield is not established as a service part.

Canon VIDEO SERVICE MANUAL REPORT

Technical Service Department, Canon Inc.

Report No. AD-371N-P-S

1/1

Date November 20, 1989

Canon E80A, E, F

NTSC

1. Flexible Connector Addition (T/W Power Sw.)
2. Parts Control Information

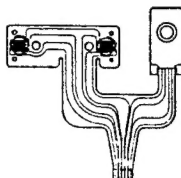
PAL

SECAM

1. Flexible Connector Addition (T/W Power Sw.)

1-1 Addition

To meet the request from the market, a flexible connector (DH2-0955-000) is established for the T/W Power Sw. as a new service part.



2. Parts Control Information

2-1 Deleted parts : N/A

2-2 Changed parts : N/A

2-3 New service part :

| PART No. | CLASS | Q'TY. | DESCRIPTION |
|--------------|-------|-------|---------------------|
| DH2-0955-000 | C | 1 | FLEXIBLE, CONNECTOR |

Canon VIDEO SERVICE MANUAL REPORT

Technical Service Department, Canon Inc.

Report No. AD-408N-P-S

1/1

Date July 20, 1990

Canon MC-4B

NTSC

PAL

F-PAL

1. Drive Gear Change
2. Parts Control Information

1. Drive Gear Change

1-1 Change

From the H800 series, the MC-4C has been mounted instead of the MC-4B. With this change, the following parts are changed.
(consolidated with the parts for the MC-4C)

| Old | New |
|------------------|-------------------|
| DY4-2667 (White) | DY4-2742 (Yellow) |
| DY4-2668 (Blue) | DY4-2743 (Green) |

1-2 Classification : N/A

1-3 Interchangeability :

- For the MC-4B, both types (old and new) can be used.
- For the MC-4C, the new type only can be used.

2. Parts Control Information

2-1 Deleted parts : N/A

2-2 Changed parts : DY4-2667 Deleted after old stock depleted.
DY4-2668 Deleted after old stock depleted.

2-3 New Service Parts

| PART NO. | CLASS | Q'TY. | DESCRIPTION |
|------------------|-------|-------|-------------|
| DY4-2742-000 000 | C | 1 | GEAR |
| DY4-2743-000 000 | C | 1 | GEAR |

Canon VIDEO SERVICE MANUAL REPORT

Technical Service Department, Canon Inc.

Report No. AD-416N-P
F-PAL 1/1

Date September, 20, 1990

Canon E80A, E, F / E808A, E, F

1. Part Change

2. Parts Control Information

NTSC

PAL

F-PAL

1. Part Change

1-1 Change

For parts availability, a Flexible Connector Ass'y (DY2-0955-000) has been deleted.

Instead, a Zoom Switch Ass'y. (DY2-1310-000 for E80, DY2-1311-000 for E808) is added.

2. Parts Control Information

2-1 Deleted part: DH2-0955-000

2-2 Changed parts: N/A

2-3 New Service parts:

| PART No. | CLASS | Q'TY. | DESCRIPTION |
|--------------|-------|-------|---------------------------|
| DY2-1310-000 | D | 1 | ZOOM SWITCH ASS'Y. (E80) |
| DY2-1311-000 | D | 1 | ZOOM SWITCH ASS'Y. (E808) |

Canon VIDEO SERVICE MANUAL REPORT

Technical Service Department, Canon Inc.

Report No. AD-422N-P
F-PAL 1/2

Date September, 20, 1990

Canon MC-4B, MC-4C

1. New Service Part Addition

2. Coaster, Right Change

3. Parts Control Information

NTSC

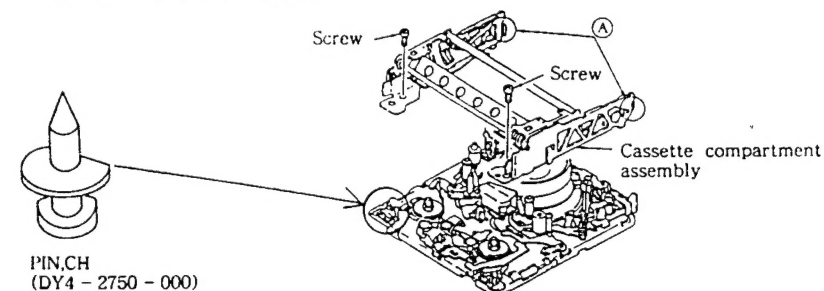
PAL

F-PAL

1. New Service Part Addition

1-1 Addition

The following positioning pin is added as a new service part for a cassette housing (S-side).



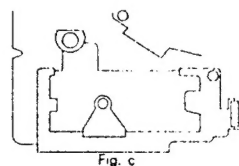
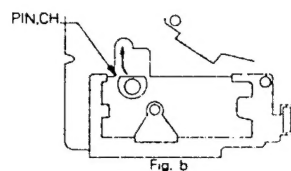
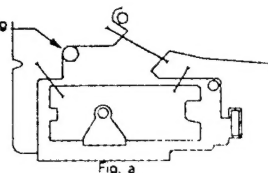
1-2 Repair information

How to use the positionig pin

- 1) Dismount the C.B.A.S and cassette compartment.
- 2) Cut off " " indicated part (three points) in the figure.
- 3) Face the cut-off part toward a side of loading motor.
Then, push it until it touches the depression of mechanical chassis completely. (Fig.b)

- 4) Confirm the position of it, and secure with the Alonalpha or equivalent. (Fig.c)

- 5) Check the tape transport.



3. Parts Control Information

3-1 Deleted/Changed parts: N/A

3-2 New service part

| PART No. | CLASS | Q'TY | DESCRIPTION |
|------------------|-------|------|-------------|
| DY4 - 2750 - 000 | C | 1 | PIN, CH |

Canon VIDEO SERVICE MANUAL REPORT

Technical Service Department, Canon Inc.

Report No. AD - 432P-F - PAL
1/1

Date October 20, 1990

Canon MC - 4B

PAL

F-PAL

Remedy for Reel Motor Error

Due to the variation of mechanism loading and the driving system of loading motor, the loading motor may be sometimes driven forward and backward repeatedly at ejecting. To repair this, perform the following measure.

1. Affected models :

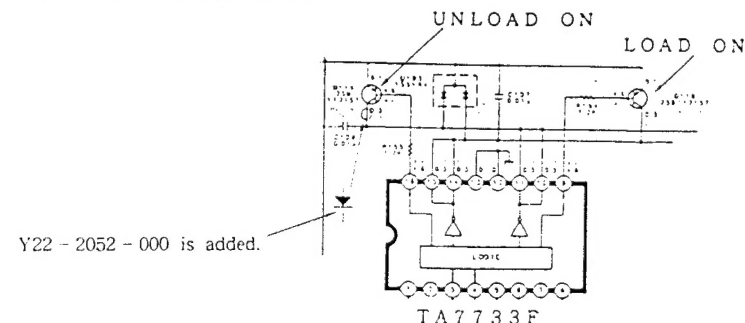
E80E,F E808E,F A1E,F

*Remarks : From the A1HiE,F, the MC - 4C has been mounted instead of the MC - 4B. The symptom will not occur because the MC - 4C adopts the pulse driving method.

3. Remedy

Check the MC - 4B of above symptom (Not - ejectable) if its loading motor moves forward and backward repeatedly, by repeating loading/unloading without the tape.

If the symptom occurs, add a diode to the connector of transistor (which turned on at unloading) to decrease the driving voltage at unloading. (Cut a pattern partly.)



Canon VIDEO SERVICE MANUAL REPORT

Technical Service Department, Canon Inc.

Report No. AD-441N·P·F-PAL

1/2

Date November 20, 1990

AD-441N·P·F-PAL 2/2

Canon MC-4B

NTSC

PAL

F-PAL

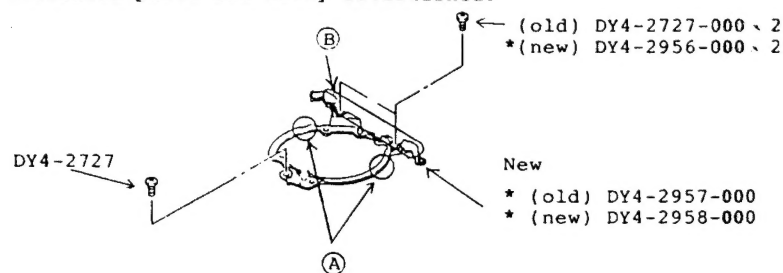
1. New Service Parts
2. Parts Control Information

1. New Service Parts

1-1 Addition

For the market request, two types (old and new) of drum base and a screw for the new type have been established as new service parts.

* indicated parts are newly established.



Remarks for the new type drum base :

(A) parts are convex to match with the concave parts of mechanical chassis.

(B) part is thicker than the old type.

1-2 Repair information

The MC-4B which has been manufactured around May, 1989 has the both types (old and new) of drum base, mechanical chassis and screw.

As they do not have an interchangeabilities each other, check the difference of shape when replacing.

| | | |
|--------------------|-----|-----|
| Drum Base | Old | New |
| | ↑ | ↑ |
| Mechanical Chassis | Old | New |

2. Parts Control Information

2-1 Deleted parts : N/A

2-2 Changed parts : N/A

2-1 New service parts :

| PART NO. | CLASS | Q'TY. | DESCRIPTION |
|--------------|-------|-------|-------------|
| DY4-2956-000 | C | 1 | SCREW |
| DY4-2957-000 | C | 1 | BASE, DRUM |
| DY4-2958-000 | C | 1 | BASE, DRUM |